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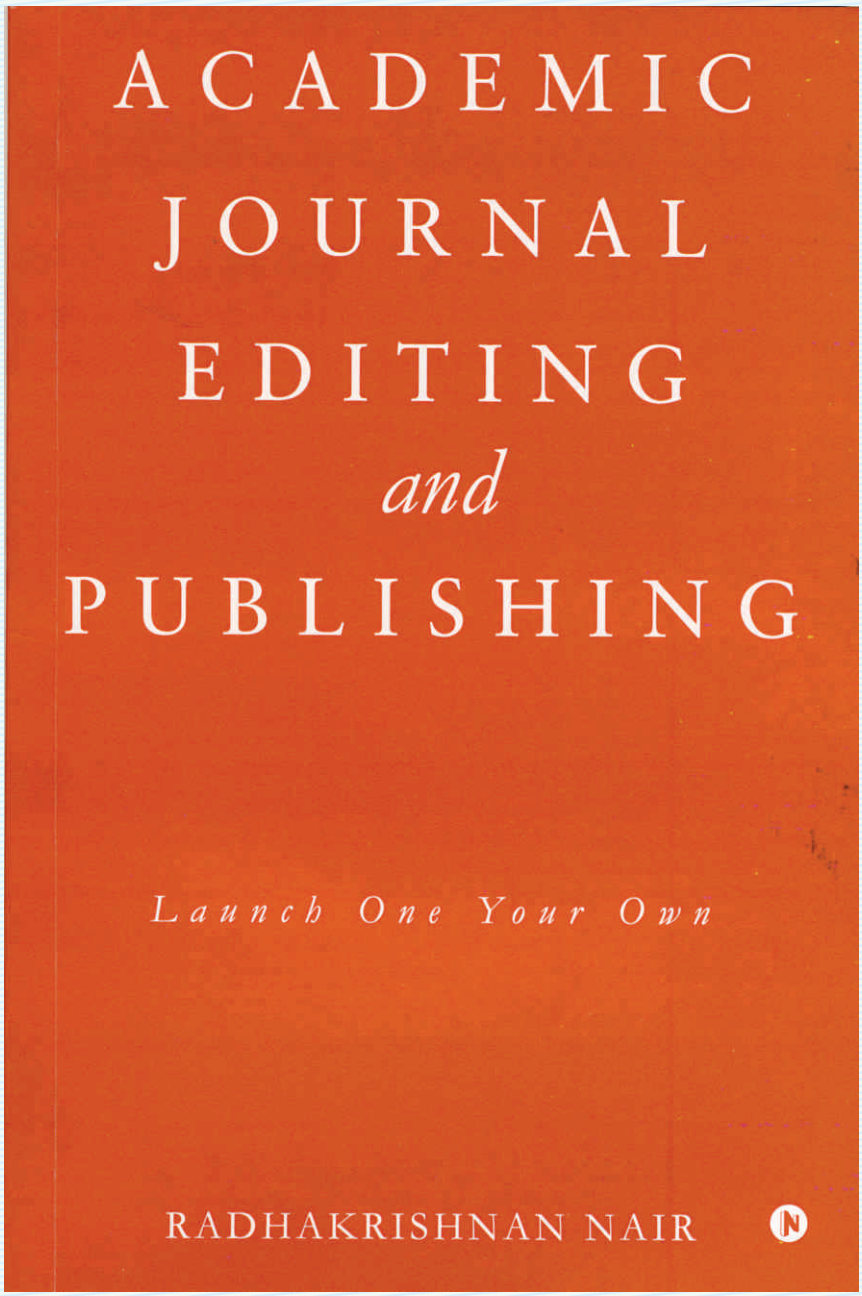

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Articles

Chairman's Overview

The concept of Product Life Cycle has been presented somewhat differently by different authors and for different audiences. The theory has been widely discussed in the academic circles and therefore lots of people know about it, but hardly anybody seems to use it in any effective or productive manner. It seems time has come to put the concept to work as a marketing tool. The objective of our lead article in this issue is to look closer on the effective utilisation of the PLC theory so that it helps to turn the concept into a managerial instrument of competitive power.

The main objective of any investor is to maximise the expected returns from the investment and to minimise the risk involved in the investment. Estimating volatility of an asset's price is a focal point for assessing the investment risk. Therefore, volatility forecasting in financial market is very significant particularly in investment, financial risk management and monetary policy making. We have pleasure to bring to you a study on estimating volatility using GARCH model as the second lead article in this issue.

The third lead article is a study that attempts to explore the ability of value investment and growth investment philosophies to predict the stock market returns.

We also feature in this issue a number of learned articles on a range of topics such as Platform Economy, Determinants of Capital Structure, Meta-analysis of Leadership Styles, User's Perception on Portable Solar Lanterns, Measuring Tourism Destination Competitiveness and the like.

I am confident that this issue will be truly informative and educative to our readers.

Dr. G. P. C. NAYAR
Chairman, SCMS Group of Educational Institutions.

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Editorial

Harmony in Triune: Art, Science, and Craft

Management is a practice. It combines art, science, and craft. Art encourages creativity. It leads to "insights" and "vision." Science provides order. It is achieved through systematic analyses and assessment. Craft makes connections. It is reached through building tangible experiences.

Art tends to be inductive. It flows from specific events to broad overviews. Science is deductive. It deduces from general concepts to specific applications. Craft is iterative. It moves back and forth between the specific and the general.

Each approaches strategy as a process of visioning in art, planning in science, and venturing in craft. Effective managing requires all these. Propriety demands their presence in perfect balance. They have to reinforce each other. They should complement each other.

Art and craft sans systematic scrutiny of science can lead to disorganized managing. Craft and science sans creative vision of art may lead to dispirited managing, careful and connected, but lacking spirit.

Craft and science sans the creative vision of art can lead to dispirited managers, careful and connected, but lacking spark. Art with science, creative and systematic without the experience of craft can produce rootless, impersonal disconnected managers. Effective managing tends to happen when the three exist, yes, co-exist. There is carping critique on MBA education of today. It is sans craft. It prefers analytics to experience. It is weak in art.

Many MBA graduates carry this imbalance to their careers. They choose jobs that favor analytics. Thus they are removed from the experience of craft. They carry this to positions in the executive suite.

It's interesting to note that a primary unit of management is a triangular format, a triune that subsumes art, science, and craft. Every unit of management shall comprise these triune basic components.

The idea discussed is the reworking on one of the gems of ideas manifested in Henry Mintzberg's Managers Not MBAs, a hard look at the soft practice of managers and management development.

Dr. D. Radhakrishnan Nair

Re-Visiting the Relevance of PLC Theory: A Delphi Based Analysis

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Abstract

This research paper attempts to address how marketing professionals with management qualification perceive, interpret and use the PLC theory in their practising life. As understood from literature review, the caveat is that there are not many publications in this domain in the recent past.

The research is based on both secondary and primary studies. The primary data from the practising executives was collected using the Delphi approach. The paper indicates that the practitioners do accept the conceptual validity, of PLC theory, but with some reservations. The practising managers contend that the successful implementation of the PLC theory depends on two important dimensions: the managers' ability to judge in assessing the environmental uncertainties and the strategic intentions of the respective organisations.

Key words: PLC theory, Delphi approach, Periodical Fluctuations, "Product Specific," "market-specific"

Both academic and practising worlds have widely accepted the value of Product Life Cycle (PLC) theory as a strategic marketing tool. At the same time, some researchers have thoroughly criticized the theory of conceptual deficiencies and strategic shortcomings. Apparently, the diverged viewpoints regarding the theory emanate because of the perceived differences in interpreting the fundamentals through which the PLC theory is constructed. Perhaps, PLC theory remains among the most variedly interpreted theories in management discipline. Besides academic viewpoints, the questions regarding the industry managers' value perception of PLC theory, at a company level, are not yet answered by the academic literature. This paper is an attempt to study the practitioners' perspective towards the utility of PLC theory.

The study is based on both primary and secondary research methods. In the first place, it evaluates both diverging and converging academic views of PLC theory through extensive analysis of research literature. Further, thesis diverging and converging were offered as input to industry managers inviting their views. The consensus among the practicing managers about the factors that are vital for practical utility of PLC theory was arrived through Delphi technique. Finally, to arrive at meaningful conclusions on the utility of PLC theory in practice, the consolidated views were derived by judging the academic literature against the practitioners' perceptions.

This article is organized as follows. Section one presents the introduction and the context of the research. Section two presents the methodology followed by inputs from literature survey in the section three. The section four contains practitioners' perspective of the key aspects of PLC theory and conclusions on strategic utilities of PLC are given in section five.

Methodology

The research was carried out in multiple stages. In the first phase, an extensive literature review was carried out to understand the theoretical assumptions, proposed utilities, and deficiencies of the theory. This also captured both converging and critical viewpoints of PLC theory among academic literature. The outcome of the first phase was used as a check-list for open ended questions in the second round.

In the second phase, Delphi technique was adopted to harvest the collective opinion of an expert panel to arrive at the converged views on the most important factors to adopt strategic prescriptions of PLC, which were identified through literature research as mentioned in the above paragraph. The key questions in the check-list were a) The conceptual validity of PLC theory, b) Noticeable characteristics of different phases, c) Is the theory useful in strategy visualization? d) Utilization of generic strategies, e) Estimation of a phase of a PLC for a given industry, f) Forecasting the length of each phase, g) Interpretation of periodical fluctuations, h) Is the theory product and market-specific, and i) Interpretation of new product

For Delphi technique, senior corporate executives were selected as panel of experts, who hold knowledge and opinion, by considering their corporate positions. After obtaining their consent to take part in the survey, questionnaires were mailed to them along with instructions. The responses from practitioners were collected and analysed to identify the common and conflicting viewpoints, as compared to academic literature. In the whole process, the researcher played the role of a facilitator.

Subsequently, the expert panel members met on a personal basis, for discussing and structuring the diverging views regarding the factors that drive the effective utilization of PLC theory. The process was carried out till a consensus was reached by the group.

The selected expert panel comprised 20 executives, one per organization, from industries spread across consumer electronics, industrial products, service and IT sector. Twelve of these were Fortune 500 companies.

For carrying out a Delphi study, the sample size becomes an objective judgement of researchers and it is researcher and situation specific, and quite often, convenience samples become a choice based on the availability of experts and resources (Reid, 1988). In his research paper, Reid researched published articles that used Delphi methods in healthcare and observed that the sample sizes varied between 10 and 1685 panelists (Reid, 1988).

Inputs from PLC literature survey

Academic views of PLC theory

The concept of Product Life Cycle (PLC) was developed in the 1950s (Dean, 1950). The theory is based on the concept of diffusion and adoption of innovations (Rogers, 1962), explaining the pattern of gradual acceptance of a new product by the market from its inception to displacement, by a new invention which is functionally and technically much

superior. Later the PLC theory was profoundly backed by a very influential research article by Theodore Levitt (1965), which made the concept much more popular, stimulating the interest of the researchers which in turn led to conducting many important research studies in this area (Willian E Cox Jr, 1967; Polli and Cook, 1969). The researchers over time initiated empirical studies on multiple aspects of the PLC concept and upheld the underlying assumptions and validity of the theory. As per the classical PLC theory, the market environmental parameters such as demand, competition intensity, technological advancements, customer knowledge, expectations, etc. keep changing, thus making the companies adopt appropriate marketing strategies at each phase of PLC to achieve their respective marketing objectives. Subsequently, the PLC theory has been portrayed, explored and annotated so often in the literature of marketing that the concept continues to be one of the fundamental topics of marketing management across the globe among both the academic fraternity and practising managers. It is observed that the Classical PLC curve pattern has been validated by at least fifteen different research studies (Rink and Swan, 1979) which were based on a variety of products ranging from consumer nondurables, consumer durables, and industrial products.

Despite some strong critiques, the product life cycle theory remains one of the prominent theories among the contingent theories of strategic management. The PLC theory prescribes generic strategies at different phases of product life (Buzzell 1966; Clifford 1977; Cox 1967; Doyle 1976; Levitt 1965; Wright 1971) as the market situation changes in each of the phases of product life cycle. Though several researchers have varied opinions of the concept of PLC and its strategic importance, the fundamental premise that there are given sets of strategies associated with each stage remains. The PLC theory can be used prescriptively to formulate strategies related to marketing, finance, production and R&D aspects of the firm as the product moves from one stage to other. Highlights of the prescribed strategies from some selected research have been presented here. For example, during the growth phase of the PLC, marketing plays a vital role as the objective of the firm remains the market share maximization (Patton 1959): highly intensified marketing activities (Hofer 1975), high price and high advertising (Buzzell 1966): publicity and aggressive sales promotion (Wasson 1974): establishment of a strong brand image and distribution niche (Fox 1973). At maturity phase, low production costs (Staudt et al. 1976; Fox 1973; Wasson 1974) and marketing effectiveness (Clifford 1977) become crucial. Optimizing capacity utilization (Hofer 1975; Smallwood 1973), increasing the manufacturing process stability (Catry and Chealier, 1974), routinizing the activities and processes (Fox 1973) and using effective mass marketing channels (Smallwood 1973) help achieve low costs. At the same time, market segmentation (Levitt 1965; Smallwood 1973), product mix broadening (Staudt et al. 1976) and improved services (Levit 1965, Staudt and Taylor 1976) contribute to marketing effectiveness. When maturity sets in, greater standardization (Dean 1950) and lower product differentiation (Buzzell 1966; Patton 1959) are suggested. Some authors also recommend that superior quality (Hofer 1975; Smallwood 1973), price penetration (Buzzell 1966; Clifford 1977; Patton 1959) and reduction in R&D expenses (Fox 1973) are crucial. At decline stage, a quick exit from the market is usually recommended (Staudt et al. 1976). Thus, milking the activities of all possible profit (Wasson 1974) is the key strategic action. Cost control (Clifford 1977) by cutting marketing expenses (Buzzell 1966; Staudt et al. 1976; Wasson 1974). Specializing the channels (Smallwood

1973), simplifying the production line (Fox 1973), relying on mass production (Forrester 1959), eliminating items that are not generating profits (Wasson 1974), reducing the product differentiation (Forrester 1959; Patton 1959), raising price (Fox 1973, Wasson 1974) and cutting R&D expenses from an initial level (Fox 1973) are all recommended as successful strategic actions. Some authors have also suggested (Hall 1980; Harrigan 1980; Porter 1980) possible existence of more aggressive strategic stances based on increasing investment and marketing efforts.

Critical views of PLC theory

Although widely accepted by both academic and practising executives, at the initial stages, the PLC theory's very existence and concept were critically challenged by some researchers. For example, Dhalla and Yuseph (1976) strongly questioned the PLC concepts and its assumptions to empirically demonstrate that the life cycle patterns of all products do not follow the classic PLC curve and they can be of many patterns varying across products and markets. In their research, they strongly presented the PLC curve as an outcome based on the impact of collective efforts of the competing firms in the industry. Hence, framing the firm's strategies based on this curve could mislead the company. As mentioned earlier, the researchers stressed the fact that

different products can have different curve patterns and classical PLC is not a universally applicable pattern. They further questioned the PLC theory's applicability in strategic management due to the facts that each phase of PLC can have a very long duration, and the annual sales often fluctuate making it difficult to predict when the next phase will appear and how long each phase lasts. Many times these fluctuations in sales will give a false impression of changing phases prompting companies to design wrong strategies.

Eleven unique curve patterns were identified by further research studies, which were entirely different from the classical PLC curve (Rink and Swan, 1979). According to Rink & Swan, the cycle–recycle pattern has been found in four studies, including drugs (Cox,1963), food products, household products (Hinkle, 1966), and industrial fluid measuring devices (Cunningham, 1969). An increasing sales pattern was observed in three studies (Cox, 1963; Buzzel,1967; Frederickson, 1969). Although two studies support the decreasing sales pattern (Buzzel, 1967; Cox, 1963), two other studies found a stable maturity pattern (Buzzel,1966; Hesden, 1966). It has been demonstrated by the above curve patterns and empirical evidence that the life cycle patterns for all products may not follow the classical PLC curve. The reasons for variations have been analysed in the later parts of this article.

One of the most exhaustive research attempts to contest the PLC concept was carried out by Marketing Science Institute, * covering approximately 100 categories in food, health, and personal care products. The outcomes were discouraging, with only 17% of the product classes and 20% of the product forms tending to follow the classical PLC pattern, and the rest have their patterns. In their report, the researchers made the following remarks:

"After completing the initial test of the life cycle expressed as verifiable model of sales behaviour, we must register strong reservations about its general validity, even stated in its weakest, most flexible form. In our tests of the model against real sales data, it has not performed uniformly well against the objective standards over a wide range of frequently purchased consumer products, nor has it performed equally well at different levels of product sales aggregation .... Our results strongly suggest the life cycle concept, when used without careful formulation and testing as an explicit model, is more likely to be misleading than useful "*. They cited a dramatic example of few companies having achieved success due to the imaginative marketing strategies by ignoring the PLC theory.

To sum it up, the literature review of PLC theory highlighted two essential perspectives but mutually contradicting. One school of thought adhered strictly to the tenets of the theory in accepting it and its usefulness as a strategic tool. The other one has virtually challenged the very existence of PLC theory and its validity as a strategic tool. It proposes that PLC is a result of the impact of collective efforts of competing firms, and it cannot be a basis for strategy formulations. It also suggests that the strategies prescribed by the PLC theory can be fatal for a firm if it is applied without exercising caution. Finally, some diversely interpreted fundamental concepts of PLC theory.

In the following section, the views of the practising managers are presented, concerning the practical utility of PLC theory and the challenges in implementing the strategic prescriptions.

*Refer Rolando Polli and Victor J. Cook's " A Test of the Product Life Cycle as a Model of Sales Behavior," Market Science Institute Working Paper, November 1967, p.43 also their "Validity of Product Life Cycle," The Journal of Business, October 1969, p.385.

Practitioners' perspectives

The analysis of first round of responses, which were conducted through mailed questionnaires among the corporate executives revealed some areas of agreements with academic literature and some challenges while implementing strategic prescriptions of PLC theory. The measurement parameters, which were identified through a literature survey and subsequent pilot interviews, were used to assess the areas of agreements and challenges and are explained in the following paragraphs.

Areas of agreements

Conceptual validity of PLC theory

Out of 20 responses, the cluster analysis was carried out to assess the spread of the responses. It was found the responses were formed into two clusters with 15 and five responses in each with respective cluster centres as 5.6 and 3.4. The results indicated that there is almost a consensus among the respondents about the conceptual validity of PLC theory.

Final Cluster Centers

	Cluster	
	1	2
Conc_valid	5.60	3.40

Number of Cases in each Cluster

Cluster	1	15.000
	2	5.000
Valid		20.000
Missing		.000

Similarly, some other parameters where near consensus among the respondents was found are as follows: a. Industry characteristics across various phases are practical and noticeable, b. Useful in general visualization on the long run, and c. Generic strategies give a vague idea for strategic approaches.

The cluster analysis of the responses obtained on a seven-point scale are presented hereunder.

Parameters	**No. of response clusters**	**No. of responses in each cluster and cluster centers (7 point scale with 1 being SD and 7 is SA)**	**Remarks**
Conceptual validity	2	15 and 5 with respective cluster centers as 5.6 and 3.4	Consensus on collective opinion
Noticeable characteristics of different phases	2	16 and 4 with respective cluster centers as 5.8 and 3.54	Consensus on collective opinion
Useful in strategy visualization	2	16 and 4 with respective cluster centers as 5.82 and 3.76	Consensus on collective opinion
Vague utilization of generic strategies	2	14 and 6 with respective cluster centers as 5.4 and 3.4	Consensus on collective opinion

Challenges in implementing strategic prescriptions of PLC theory

Although the corporate executives accept the validity of PLC theory, they expressed that the strategic prescriptions cannot be adopted as they were proposed by academic literature.

The practitioners also carry wide-ranging comprehensions regarding PLC theory and applications in the real-world. Several challenges, practitioners face while implementing theory's strategic prescriptions, have been highlighted in the following paragraphs.

Most of the senior executives, with business-related education, were familiar with the PLC theory, but the perceptions and interpretations of critical underlying fundamentals, which are essential to understanding PLC theory, varied to a great extent.

Majority of the senior executives, involved in corporate planning, considered PLC as a useful tool in corporate planning. It helped them, by visualizing the trends in business environments, getting equipped with appropriate strategies in place. Further probing, to assess its utility as a strategic tool at a firm level, raised many conceptual misinterpretations.

The significant challenges that practitioners envisage while using the PLC theory in practice are discussed hereunder. These were identified and dwelled upon during personal interview using the Delphi technique. In the end, the collective opinion about the issues that can contribute towards the practical utilization of PLC theory is presented.

Estimating the present phase of PLC for a given industry

About a quarter of the respondents admitted that estimating the present phase of their product, on PLC curve, is quite tricky. The senior managers of leading companies, from the same industry, differ in their estimation of the present phase of their industry on PLC curve. The academic literature, in this aspect, also does not present the criteria for identification or demarcation of different phases. The academic guidelines such as competition intensity, industry growth rate, and entry to exit ratios of firms are too indistinguishable, and hence the estimation, of PLC phase, is left mainly to the analytical judgement of the individual executives.

Forecasting the length of each phase

Furthermore, almost every respondent expressed that it would be an unattainable task to forecast the length of each phase and, likewise, the industry sales over long range. Even academic literature suggests that the sales pattern of a product in the long run depends on multiple forces such as demand side, supply side and exogenous factors (Lambkin and Day, 1989) which are often not under corporate control and hence cannot be foreseen. It is, therefore, impractical to adopt PLC theory in making real-time strategies for their companies due to the lack of certainty on both the existing phase and the future course of the PLC curve.

In some industries, the phase-wise strategic prescriptions are impractical to consider due to the extremely long PLC phases running into many decades. For example, in the case of an electric motor manufacturer, a senior executive expressed that the market had been growing for more than 60 years due to the increase in motor applications and the continuous growth of user industries. The strategies that have been changing according to the changes in market dynamics, and by adhering to the strategies prescribed by PLC for all these years, just do not work.

Wrong signals from periodical fluctuations

The periodical fluctuations in sales due to incidental changes in business environments tend to be falsely interpreted as changes in PLC phase and may prompt companies to respond to inappropriate strategies. Example of this trend is the depression set over global air conditioning markets due to the recent economic slowdown. During the period of slowdown, demand diminishes swiftly as consumers quickly reduce their spending on expensive products. The air conditioning market, given the product's status as a discretionary item, was no exception and displayed reduced sales. This trend perhaps can be temporary but gives a false impression of change in the phase of PLC if one is not cautious by the judgment.

PLC theory is "product-" and "market-specific"

PLC theory is product- and market-specific. Corporate executives have different perceptions of the meanings of these terms while attempting to use PLC theory, and their decisions are based on their respective perceptions. Concerning the meaning of the term "product" in PLC, the interpretations varied with meanings such as industry, market, product class, product form, organization and brand life cycles. Among these definitions, product form seems to be most widely interpreted definition of "product." Along the similar lines, the academic literature has similar ambiguities in interpreting product.

In the academic literature, there are conceptual differences among researchers with respect to the definition of "product" for meaningful interpretation of the PLC theory. Different authors have suggested different product frameworks in their research on PLC theory. For example, market life cycles (Levitt 1965), industries (Porter 1980), product classes (Day 1981; Harrell and Taylor 1981; Polli and Cook 1969), product forms and brands (Enis, La grace, and Prell 1977; Rink and Swan 1979; Levitt 1965). Whereas Kotler has discussed the PLC within the context of demand life cycle and the product category life cycle. But each of these interpretations has problems when applied to understand the PLC theory. The industry as a definition of product is difficult to accept as it embraces several product classes with each one having different markets and unique characteristics. For example, automobile industry comprises the products from trucks, buses, vans, and cars. Each of these has had a different evolution pattern and often a different market structure. Even a definition of a product class is difficult to accept as it embraces many product forms and each would have started at different points of time hence leading to non-synchronization of PLC phases with each other. According to academic literature, considering the product form also may not be meaningful as the market size becomes very small and strategically it may not be of high value. In his recent textbooks, Kotler used a hierarchy in defining the product class, product form and brand life cycles, respectively. Due to these conceptual differences among researchers in defining the product, it becomes exceedingly difficult to compare the studies.

On the other hand, similar to the definition of product, the definition of the term "market," while interpreting the PLC theory, also attracts a wide range of responses from practising managers, as discussed in the previous sections. Based on the concern of the practising executives, the perception of the word "market" is more subjective than objective. In practice, the word market is more company-specific than universal. Hence, it is creating a huge disconnect between those companies that are operating at regional and national levels and between companies that are operating in selected market segments and the whole market. For example, a company that manufactures cooking appliances in the southern part of India is marketing its products only in southern parts of India, and it is designing strategies to suit the changes happening in its regional market but not concerned about the national market. Another leading competing company from southern India is focusing on the whole national market, interpreting the PLC theory in formulating their long-term strategies as per the demands of the national market. This indicates that the PLC adaptation varies significantly between two companies that operate at two levels of a market. It leads to scepticism whether the PLC theory is a universal phenomenon or market-specific. In its presence, it applies differently to the companies that are regional, national and global. Even at the global level, different countries have different market potential for a given product and different pattern of acceptance of a new product due to inherent reasons. For example, Asia Pacific is now budding as the leading regional market for consumer durables, wherein the stimulating aspects such as growth in urban population moderated the effect of the global slowdown on regional economies, promising job markets and subsequent high-income levels and increases in the household per capita income in countries such as India and China. The growth curve in Asia Pacific market is accelerating, whereas in advanced countries it appears to have reached the maturity stage.

PLC theory is country-specific

Most of the research on PLC theory have been carried out in the US market, and most of the researchers have considered the US as the market for evaluating their analysis. Does it mean that the definition of a market is country-specific? In that case, each product should have different PLC curves for different countries. It will further complicate the situation in the gradually globalizing world where the products are being launched simultaneously in multiple countries. For example, recently the Apple Ipad 2 has been simultaneously launched in many countries. How does this multi-country launch account for in PLC curve? Many companies may have targeted only a part of the country as their market and how they interpret PLC theory and derive strategic benefits because they never get connected with the developments in the overall market. For example, a country like India has a vast cultural, economic, and lifestyle differences across the various parts of the country. Due to these inherent differences, different regions often show various acceptance patterns of a new product. Then the strategy becomes region-specific and cannot be common across the country. That means the different regions of the same country may have a single product in various phases of the PLC curve.

Interpretation of the definition of "new product."

A "new product" can vary from an invention of a product that did not exist before or may involve a significant modification to the existing mother product. For example, should LED televisions be considered as a new product with an exclusive PLC or should it be considered part of the CRT television PLC? Most often the new products are modifications of the existing ones with improvements in technology, design, performance, etc. It is becoming a challenge as to when to call a product as new and when to initiate a PLC curve, and no formula is accepted universally. Practising managers are also not sure about the definition of a new product, hence their responses were highly confusing. The same product was often analysed as new by an executive, but another executive in the same industry held a contradicting opinion. With these diverged views and inconsistent comprehension of the phases of PLC, the two will probably pursue their own strategic path. One example is 3D cameras and camcorders. A very senior-level executive of a global brand opined that the 3D camera is a new product and most of the characteristics of the introduction phase of PLC apply for this new product.

In contrast, an executive of a competing brand expressed it as an extension of the existing product line with the new technology. It seems that the market is aware of the product and therefore, there is no competition. More interestingly, it is also noticed that since the existing brands offer the product, no new brands enter the market. This logic seems right, as it does not match with an academic description of an introductory phase of a PLC.

Even in the academic literature, the details of clear demarcation are not available. One of the researches has highlighted that this question involves the "most complex

element to untangle in understanding the PLC concept" (Patton, 1959). According to Patton (1959), the new product can be segregated into several degrees of newness. As the researcher says "there appears to be a few universally recognised characteristics distinguishing the new product from an improved variation of an old one." Continuing, this researcher classifies the new products as the unquestionably new product, partially new product, significant product change, and the minor product change.

As per the academic textbooks, a new product is classified as new to the world product, new to the company, modification of the existing product, and repositioned product. However, it is still not spelt out as to for which category of new product definition applies to the PLC theory. In the absence of clear-cut demarcation guidelines, there is always a possibility that the PLC theory can be incorrectly interpreted and applied, resulting in wrong implementation strategies.

Conclusions

After going through a questionnaire round, and two rounds of personal interviews, we encapsulate the views and opinions in the following sentences to present the relevance of the PLC prescriptions in the current business scenario.

a. Corporate executives conclude that the PLC theory has many functional limitations despite its conceptual validity and empirical demonstrations of its strategic prescriptions.
b. The application of its strategic prescriptions in the generic form is not practical. Many factors are making it too complicated for a firm to borrow the PLC prescriptions.
c. The most important factors are the perception differences in important underlying definitions such as difficulties in forecasting the sales trends; an extremely long period of each phase; different curve patterns for different product categories; false impressions of phase changing due to incidental variations in sales etc.
d. Business situations being faced by firms and their strategic orientations demand that the strategic prescriptions of PLC theory should be fine-tuned by considering the firm's competitive ability.
e. The successful application of PLC strategies in one company or situation does not guarantee success in another. Instead, it is crucial to examine how the contextual, organisational, and human dimensions affect a company. The meaningful application of its strategic prescriptions depends on too many forces at larger economic, industry and firm levels.
f. The executives should develop an understanding of how contextual, organizational, and human dimensions affect the meaningful interpretation and utilisation of PLC theory.
g. Effective utilisation of PLC theory depends on two critical aspects: the judgement ability of the managers in assessing the environmental uncertainties and the strategic intentions of the respective organisations.

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Estimating Volatility: GARCH Model for BSE SENSEX

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Abstract

This study is an attempt to estimate volatility using the GARCH (1, 1) model based on Indian stock market data. BSE SENSEX data have been analysed. The Maximum Likelihood Method has been used for estimating GARCH (1, 1) parameters. To assess the effectiveness of the model over the reference period, autocorrelation structures of the relevant variables have been analysed. Here, the BSE SENSEX return volatility has been found to be less than 2% per day, but volatilities as high as 5.5% per day have been also experienced during the global financial crisis. Therefore, this study reinforces that markets tend to be highly volatile during the times of crisis. The long-run annual volatility was found to be 25.25% over the reference period. The positive long-run volatility implies that the GARCH model developed in this study is a stable one. Alternatively, the same is established by the fact that the sum of the parameters α and β is less than 1, i.e., $\alpha+\beta$

Key words: *Volatility, GARCH, Maximum Likelihood Method, Autocorrelation*

Researchers often use historical data to yield estimates of the current and future levels of volatilities. A number of models with imposing names such as, Exponentially Weighted Moving Average (EWMA), Autoregressive Conditional Heteroscedasticity (ARCH), and Generalized Autoregressive Conditional Heteroscedasticity (GARCH) are used for estimating volatilities. The typical feature of these models is that they recognise that volatilities are not static. During some periods, a particular volatility tends to be relatively low, whereas it becomes relatively high during other periods. These models attempt to capture the fluctuations in the volatility through time. Many researchers have built models for estimating volatilities and tested them in different countries for different time horizons. Of late, however, studies on volatility modelling focussing exclusively on Indian stock market have been rather limited in number. This is an impetus behind taking up this study.

This study attempts to estimate volatility using the GARCH (1,1) model based on Indian stock market data. As a proxy for the Indian stock market data, historical BSE SENSEX data have been analysed. The Maximum Likelihood Method has been used for estimating GARCH (1,1) parameters. For assessing the effectiveness of the model over the reference period, autocorrelation structures of the relevant variables have been studied. More specifically, the study is an endeavour to estimate the GARCH (1,1) parameters, long-run volatility, and the overall volatility in BSE SENSEX daily returns over the reference period. The study also tests the effectiveness of the GARCH model through the analysis of the autocorrelation structures of the relevant variables.

Methodology and Data

GARCH (1,1) Model

The GARCH (1,1) model was proposed by Bollerslev in 1986. The equation for GARCH (1,1) model is:

$$\sigma_n^2 = \gamma V_L + \alpha u_{n-1}^2 + \beta \sigma_{n-1}^2 \dots\dots\dots\dots\dots (1)$$

Where,

σ_n^2 = Variance of a market variable on day n

V_L = Long-run variance rate

γ = Weight assigned to V_L

u_{n-1}^2 = Squared percentage change in a market variable on day n-1

α = Weight assigned to u_{n-1}^2

σ_{n-1}^2 = Variance of a market variable on day n-1

β = Weight assigned to σ_{n-1}^2

As the weights must sum to 1, $\gamma + \alpha + \beta = 1$.

Setting $\omega = \gamma V_L$, the GARCH (1,1) model can also be written as:

$$\sigma_n^2 = \omega + \alpha u_{n-1}^2 + \beta \sigma_{n-1}^2 \quad \text{.....(2)}$$

This is the form of the model that is usually used for the purposes of estimating the parameters. Once ω, α, and have been estimated, we can calculate γ as $1-\alpha-\beta$. The long-run variance V_L can then be calculated as ω/γ. For a stable GARCH (1,1) process, we require $\alpha+\beta<1$. Otherwise, the weight applied to the long-term variance turns out to be negative.

Maximum Likelihood Method

In this study, the Maximum Likelihood Method has been used to estimate the parameters for GARCH (1,1) model. Basically, the method works by finding the most likely values of the parameters given the actual data. More specifically, a log-likelihood function is formed and the values of the parameters that maximise it are looked for. A set of parameter values are selected that are most likely to have yielded the observed data. This is done by first constructing a likelihood function, denoted LF. LF is a multiplicative function of the actual data, which is difficult to be maximised with respect to the parameters. To avoid this problem, its logarithm is taken to convert LF into an additive function of the sample data, i.e. the LLF

Let us define $v_i=\sigma_i^2$ as the variance estimated for day i and assume that the probability distribution of υ_i conditional on the variance follows the normal distribution. Given the assumption, the best parameters of the model are the ones that maximize the value of the following equation:

$$LF = \prod_{i=1}^{m} \left[\frac{1}{\sqrt{2\pi v_i}} e^{\frac{-u_i^2}{2v_i}} \right] \quad \text{.....(3)}$$

Taking logarithms, it can be shown that this is equivalent to maximizing:

$$LLF = \sum_{i=1}^{m} \left[-\ln(v_i) - \frac{u_i^2}{v_i} \right] \quad \text{.....(4)}$$

Data Collection

In this study, the financial time series data on BSE SENSEX between January way 3, 2005, and October 31, 2018 have been analysed for estimating volatility using GARCH (1,1) model. The reference period for this study has been chosen to include substantially adequate data points before, during, and after the global financial crisis. The relevant data have been collected from the BSE website.

Data Analysis

Figure 1 and Figure 2 show the histograms and descriptive statistics for SENSEX and its daily return. Over the reference period, the SENSEX ranges from 6,102.74 to 38,896.63 with a mean of 19,837.36 and standard deviation of 7,678.34. SENSEX data points are positively skewed and show lesser peakedness than that of the normal distribution. Daily return on SENSEX ranges from -10.96% to 17.34% with a mean of 0.058% and standard deviation of 1.408%. Daily return data points are also found to be positively skewed and leptokurtic in nature. This is in line with the tendency for financial asset returns to have distributions that have fat tails and excess peakedness at the mean. It is clear from Figure 3 and Figure 4 that the daily return on SENSEX is much more volatile than the SENSEX itself. Daily return data points are characterised by volatility clustering or volatility pooling, i.e., the tendency for volatility in financial markets to come along in clusters. As a result, large returns (of either sign) are likely to follow large returns, and small returns (of either sign) to follow small returns. An arguable explanation for this phenomenon, which appears to be an almost universal characteristic of asset return series in finance, is that the information arrivals which bring about price changes themselves occur in clusters rather than being evenly spaced over time. Leverage effects are also found to be present in daily return data. Leverage effects show the tendency for volatility to rise more following a large price decrease than following a price increase of the same magnitude.

Figure 1

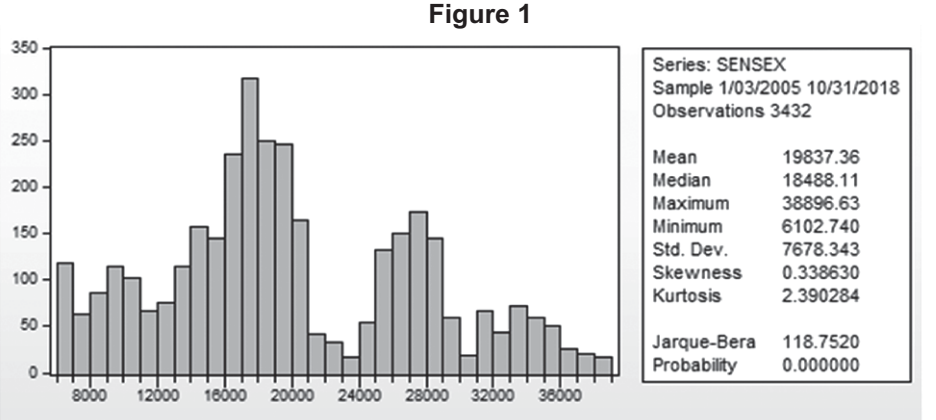


Figure 2

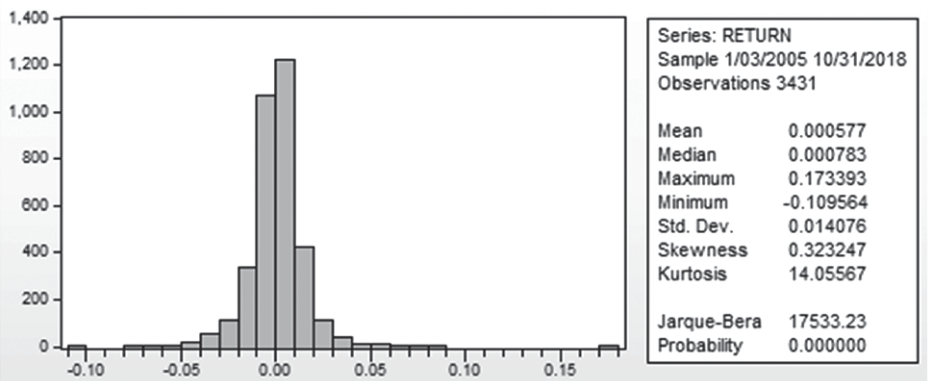


Figure 3

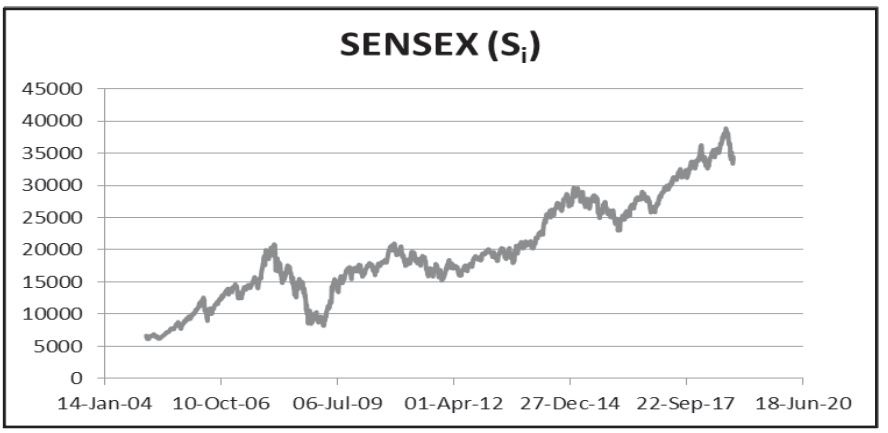
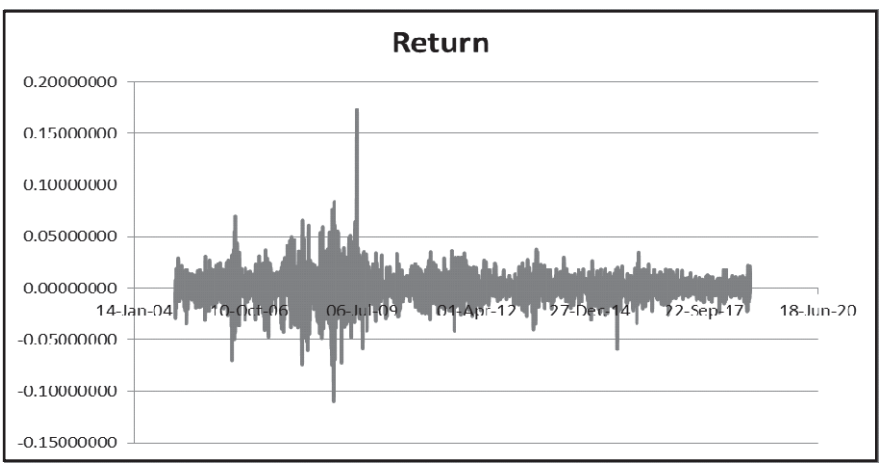


Figure 4



The Exhibit 1 indicates how the calculations have been organized for the GARCH (1,1) model. The Exhibit analyses data on the BSE SENSEX between January 3, 2005, and October 31, 2018. The column titled "Return (u_i)" shows the proportional change in the BSE SENSEX between the end of day i - 1 and the end of day i and can be calculated as follows:

$$u_i = \frac{S_i - S_{i-1}}{S_{i-1}}$$

The variance rate for day i measured at the end of day i – 1 is:

$$v_i = \sigma_i^2$$

For 5th January 2005, i.e., the 3rd day, we begin by setting the variance equal to u_i^2. For subsequent days, equation (2) is used for calculating the variance. The column titled "Likelihood" shows the likelihood measure, i.e., $-\ln(v_i) - u_i^2/v_i$. Please note that volatility is just the square root of the variance.

For our study, the optimal values of the parameters that maximise equation (4) work out to be:

$$\omega = 0.0000013$$

$$\alpha = 0.0800411$$

$$\beta = 0.9147702$$

Therefore, our GARCH (1,1) model is:

$$\sigma_n^2 = 0.0000013 + 0.0800411u_{n-1}^2 + 0.9147702\sigma_{n-1}^2 \quad ..(5)$$

Exhibit 1

	A	B	C	D	E	F	G
1							
2	**Date**	**SENSEX (S_i)**	**Return (u_i)**	**Variance (v_i)**	**Likelihood**	**Volatility**	
3	03-Jan-05	6679.2					
4	04-Jan-05	6651.01	-0.00422057				
5	05-Jan-05	6458.84	-0.02889336	0.00001781	-35.93008605	0.00422057	
6	06-Jan-05	6367.39	-0.01415889	0.00008443	7.00511151	0.00918847	
3432	29-Oct-18	34067.4	0.02153238	0.00013564	5.48728048	0.01164637	
3433	30-Oct-18	33891.13	-0.00517415	0.00016250	8.56007905	0.01274758	
3434	31-Oct-18	34442.05	0.016255581	0.00015211	7.05369833	0.01233313	
3435							
3436							
3437		0.131250868	0.000001313		**27231.07411**		
3438		0.914770194	0.914770194				
3439		0.800411472	0.080041147				
3440							
3441	Long run variance per day		0.000252957				
3442	Long run volatility per day		0.015904629				
3443	Long run volatility per year		0.252478159				
3444							

Solver searches over
B3437 (which is ω*100000)
B3438 (which is β)
B3439: (which is α*10)
The likelhood function (to be maximized) is in E3437
ω, β, and α are in C3437:C3439.

The maximum value of the function in equation (4) is 27,231.074[1].

$\gamma = 1 - \alpha - \beta = 1 - 0.0800411 - 0.9147702 = 0.0051887$

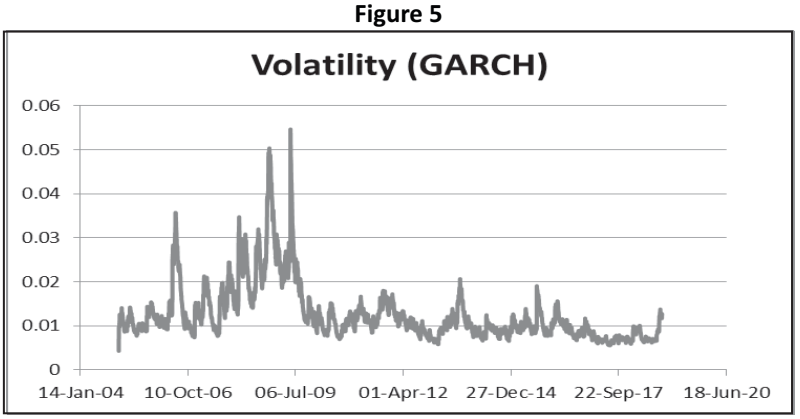
The long-run daily variance rate (V_L) = $\omega/\gamma = 0.0000013/0.0051887 = 0.0002530$

The long-run daily volatility = $\sqrt{0.0002530} = 0.0159046$ or 1.59046%

The long-run annual volatility = $0.0159046 \times \sqrt{252} = 0.2524781$ or 25.24781%

Figures 5 shows volatility of SENSEX daily returns as per the GARCH (1,1) model during the time period covered by the data in this study. Most of the time, the volatility was less than 2% per day, but volatilities as high as 5.5% per day were experienced during the global financial crisis. Therefore, this study vindicates the leverage effects observed in the financial markets at the times of crisis. Due to leverage effects, market volatility increases more than proportionately following large price dips-a common phenomenon in a financial market debacle. In fact, all market variables tend to move unfavourably together during a financial crisis. This is technically known as correlation risk.

Figure 5



Effectiveness of the Model

The assumption implicit in a GARCH model is that volatility changes with time. During some periods volatility appears to be relatively high while during other periods it tends to be relatively low. In other words, when u_i^2 The assumption implicit in a GARCH model is that volatility changes with time. During some periods volatility appears to be relatively high while during other periods it tends to be relatively low. In other words, when is high, $u_{i+1}^2, u_{i+2}^2, \ldots$ tend to be high; when u_i^2 is low, $u_{i+1}^2, u_{i+2}^2, \ldots$ tend to be low. This property can be tested by analysing the autocorrelation structure of u_i^2 values. Let us assume the u_i^2 values suffer from autocorrelation problem. If a GARCH model fares well, it should get rid of the autocorrelation problem. We can test whether it has done so by considering the autocorrelation structure for the $\frac{u_i^2}{\sigma_i^2}$ series. If this series shows very little autocorrelation, our model has come through in addressing autocorrelation in u_i^2 values. Exhibit 2 shows u_i^2 and $\frac{u_i^2}{\sigma_i^2}$ values.

Exhibit 3 shows results for the autocorrelation analysis. It is clear u_i^2 from Exhibit 3 that autocorrelations are positive for $\frac{u_i^2}{\sigma_i^2}$ corresponding to all lags between 1 and 15. In the case of , some of the autocorrelations are positive and some are negative. Also, they are much smaller in magnitude. Therefore, the GARCH model appears to have done a good job in addressing the autocorrelation problem.

Exhibit 2

	J	K	L
1	Autocorrelation Analysis		
2	$(\text{Return})^2$	$(\text{Return})^2/\text{Variance}$	
5	0.00083483	46.86565844	
6	0.00020047	2.37450113	
3432	0.00046364	3.41824031	
3433	0.00002677	0.16474933	
3434	0.00026424	1.73723367	
3435			

Exhibit 3

	F	G	H	I	J	K	L
3456	Lag	Autocorrelation (u^2_i)	Autocorrelation (u^2_i/σ^2_i)	w_k	LB before GARCH	LB after GARCH	
3457	1	0.128898283	-0.005501759	1.00087489	0.01662930	0.00003030	
3458	2	0.159909273	-0.002538533	1.00116686	0.02560081	0.00000645	
3459	3	0.143229281	0.023668507	1.00145900	0.02054456	0.00056102	
3460	4	0.210646777	0.015403177	1.00175131	0.04444977	0.00023767	
3461	5	0.143334886	-0.012189385	1.00204380	0.02058688	0.00014888	
3462	6	0.136776204	0.024128148	1.00233645	0.01875144	0.00058353	
3463	7	0.165289942	-0.011878551	1.00262927	0.02739260	0.00014147	
3464	8	0.117106676	-0.019296575	1.00292227	0.01375405	0.00037345	
3465	9	0.147397966	-0.011894725	1.00321543	0.02179602	0.00014194	
3466	10	0.203526436	0.023620322	1.00350877	0.04156835	0.00055988	
3467	11	0.149764834	-0.017522766	1.00380228	0.02251479	0.00030821	
3468	12	0.109310619	-0.011339375	1.00409596	0.01199775	0.00012911	
3469	13	0.127033152	0.006539228	1.00438982	0.01620826	0.00004295	
3470	14	0.127314339	0.002207967	1.00468384	0.01628486	0.00000490	
3471	15	0.12677728	0.00859449	1.00497804	0.01615249	0.00007423	
3472					**1146.415563**	**11.46987018**	

Another way to conduct significance text for the autocorrelation coefficients is to construct a non-rejection region (like a confidence interval) for an estimated autocorrelation coefficient to determine whether it is significantly different from zero. For this study, a 95% non-rejection region would be given by:

$$\pm 1.96 \times \frac{1}{\sqrt{3430}}$$

Upper confidence limit = $1.96 \times 1/\sqrt{3430} = 0.0335$

Lower confidence limit = $-1.96 \times 1/\sqrt{3430} = -0.0335$

It is clear from Figure 6 and Figure 7 that autocorrelation coefficients for u^2_i are significantly different from zero while the same for u^2_i/σ^2_i series are not so. This indicates that the GARCH model has done a good job in removing the autocorrelation problem.

Figure 6: Autocorrelation in u^2_i

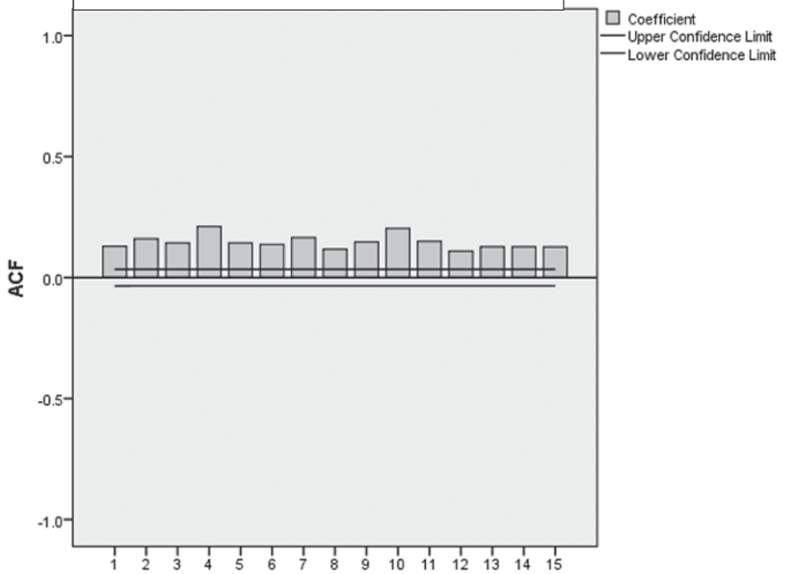
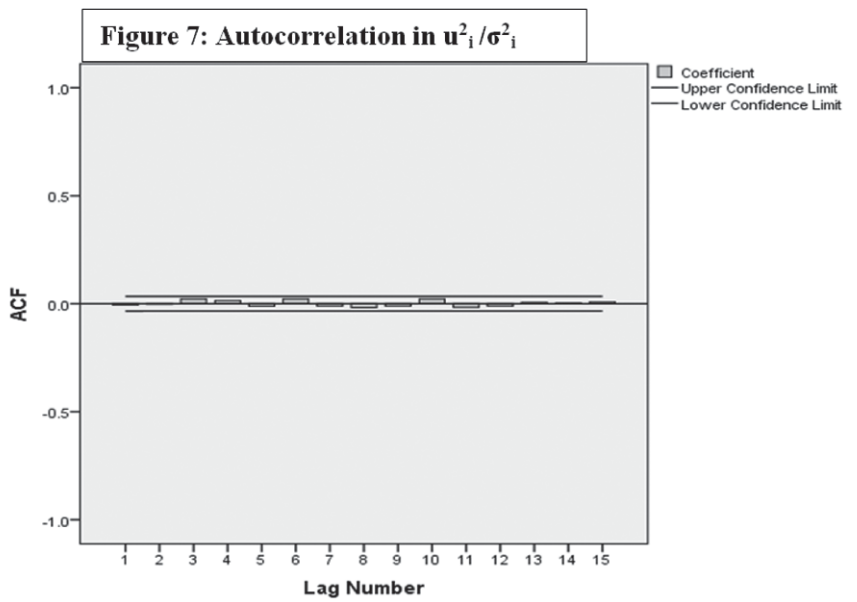


Figure 7: Autocorrelation in u^2_i / σ^2_i



For a more scientific test, the Ljung–Box statistic can be used. If a certain series has "m" observations, the Ljung–Box statistic is:

$$LB = m\sum_{k=1}^{k} w_k \rho_k^2 \quad \text{.....(6)}$$

Where,

ρ_k = Autocorrelation for a lag of k

K = Number of lags considered

$$w_k = \frac{m+2}{m-k}$$

For K = 15, zero autocorrelation is rejected with 95% confidence when the Ljung–Box statistic is greater than 25. From Exhibit 3, the Ljung–Box statistic for the u_i^2 series is 1146.42. This is a strong evidence of autocorrelation. For the u^2_i/σ^2_i series, the Ljung–Box statistic is 11.47, suggesting that the autocorrelation has been largely removed by the GARCH model.

Findings and Conclusions

In this study, the financial time series data on BSE SENSEX between January 3, 2005, and October 31, 2018 have been used for analysis. SENSEX data points are found to be positively skewed and platykurtic in nature. Daily return data points are also found to be positively skewed. However, they are leptokurtic in nature. The daily returns on SENSEX are found to be much more volatile than the SENSEX itself. Volatility clustering or volatility pooling, and leverage effects are found to be present in daily returns.

As per this study, most of the time, the BSE SENSEX return volatility as estimated by GARCH model was less than 2% per day, but volatilities as high as 5.5% per day were experienced during the global financial crisis. Therefore, this study is a testimony to the fact that stock markets tend to be highly volatile at the times of crisis. The long-run annual volatility for BSE SENSEX return during the reference period is found to be 25.25%. The positive long-run volatility implies that the GARCH (1,1) model developed in this study is a stable one. The same is also supported by the fact that the sum of the parameters α and β is less than 1, i.e.,

$$\alpha + \beta < 1.$$

$\omega = 0.0000013$

$\alpha = 0.0800411$

$\beta = 0.9147702$

$$\sigma_n^2 = 0.0000013 + 0.0800411u_{n-1}^2 + 0.9147702\sigma_{n-1}^2$$

The maximum value of the function in equation (4) = 27,231.074[1].

$\gamma = 1 - \alpha - \beta = 1 - 0.0800411 - 0.9147702 = 0.0051887$

The long-run daily variance rate (V_L) = ω/γ = 0.0000013/0.0051887 = 0.0002530

The long-run daily volatility = $\sqrt{0.0002530} = 0.0159046$ or 1.59046%

The long-run annual volatility = $0.0159046 \times \sqrt{252} = 0.2524781$ or 25.24781%

The assumption underlying a GARCH model is that volatility changes with time. During some periods, volatility is relatively high while it is relatively low during other periods. As a result, u_i^2 values tend to be autocorrelated. To test this, autocorrelation structure of the u_i^2 values has been analysed. The tests conducted show that the u2i values are highly autocorrelated. We know that if a GARCH model works well, it should largely eliminate the autocorrelation problem. To test this, the autocorrelation structure of u2i/σ2i series has been analysed. The results show hardly any autocorrelation in u2i/σ2i values. Therefore, the GARCH model appears to have done a fair job in removing the autocorrelation problem. Hence, it can be concluded that the effectiveness of the GARCH model over the reference period is quite satisfactory.

Endnotes:

Sometimes, Solver yields a local maximum, so testing a number of different starting values for parameters is recommended.

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Platform Economy: Evidence from Indian Market

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Abstract

Digitalisation has led to the emergence of technological advancement across the globe. The platform economy has also arrived in business as a by-product of these technologies. This paper aims to study the influence of platform economy with respect to the Indian market. The paper elucidates the transformation of organisations from traditional to platform business model. This paper also introduces innovative categories of platforms which are present in the Indian market. Such an approach is expected to create a fresh opportunity for business and scholars in strategizing opportunities for the future.

Keywords: *Digitisation, Platform, Indian market, Platform Ecosystem, Pipe business model, Multi-sided market, Network effect.*

The applications of cloud computing, big data, and new algorithms have changed the nature of global business in the recent past. McKinsey study of 414 technology-focussed global companies indicated that organizations nowadays are relying highly upon information technology (IT) for help in driving growth. Around 43 per cent of the executives of these companies feel that IT-enabled business innovations can increase earnings growth by more than 50 per cent by 2020 (Roberts and Sikes, 2012). According to the recent World Trade Report (2017), extensiveness and penetration of the innovative multidimensional technologies have the perspective to transform complete systems of manufacturing, production, and governance in any business. According to Evans and Schmalensee (2016), there are six technologies including powerful chips, programming languages, and operating systems, internet, World Wide Web, broadband communications, and cloud have expanded the scope of connection. The concept of platform has also arrived in the global business as a by-product of these technologies.

Evans and Gawer (2016) studied the Asian market and identified 82 platforms (including 54 private ownership platforms and 28 public ownership platforms) which are supposed to be the largest number across the world. According to them, China has 64 platform companies and India with eight platform companies where New Delhi and Bangalore have a cluster of platforms extending from three to five platform companies. The total market capitalisation of the companies was $930 billion with the 352 million employees. There were 454 application developers in India including 98 in New Delhi, 78 in Mumbai, 77 in Bangalore and others in different cities of India (Kathuria et al., 2015; Law, 2012) which makes India one of the emerging markets of platforms and this study also try to understand the concept of platform economy in Indian context.

In this backdrop, this paper has four objectives in specific: (a) to examine the market transformation from the traditional pipe business to platform model; (b) to identify different types of platforms in current Indian market; (c) to examine the consequences faced by the market due to platforms; and, (d) to analyse the implications of the platform economy for business and research.

The organization of the paper is as follows. Section 2 deals with the transformation of the traditional pipe business model to the platform business model and the revolution of platforms from one-sided to the multi-sided platform with the help of different concepts, definitions. Section 3 deals with the different types of the platform present in the Indian market followed by the consequences faced by the current market due to the platform in Section 4. Section 5 analyse the managerial and research implications. The concluding remarks are presented in Section 6.

The Platform Economy: An Overview

One of the important technological grounds for the origin of platform was in the mid-1990s by researchers of Netscape Corporation. They developed the protocol for recognising visitors to the web sites. The protocol involved insertion of a small code known as cookie. By using these cookies, anyone with the server can connect to the Internet to collect any data. Further, cookies could be collected by the third party providing services regarding payments, hosting, marketing and other. So, cookies rapidly become an essential for transacting and participating in online communities. As the result of the technologies and digitalisation, platforms lead to the emergence of new business and employment models (Tiwana et al., 2010). Therefore, building a platform is a major task for any business. However, platforms themselves shape the work of others by facilitating digital locations for the networks. Many authors have tried to explain the concept of the platform based on their perception and studies.

According to Tiwana et al. (2010) the platform is a "software-based system that provides core functionality shared by the modules that interoperate with it and the interfaces through which they interoperate". Kenney and Zysman (2016) defined the platform as a mediator of social and economic interactions and are likely to describe the digital era, with the three major building blocks; algorithm, internet, and cloud. Similarly, Mattila and Seppala (2015) explained that platforms are the structures that authorize collaborators-users, peers, providers to commence a variety of activities, often producing de facto standards, creating whole ecosystems for value creation. Busch et al., (2016) stated that platforms present as the main actor in the transaction by providing the standard terms for the contract between the parties. So, platform act as a 'remote control' for the contractual relationship between the parties.

Platforms are algorithm-enabled "cyberplaces" where elements like people or machinery can act or transact. Platform economy incorporates a growing number of digitally enabled activities in business, politics, and social interaction (Kenney and Zysman, 2016). In other words, the

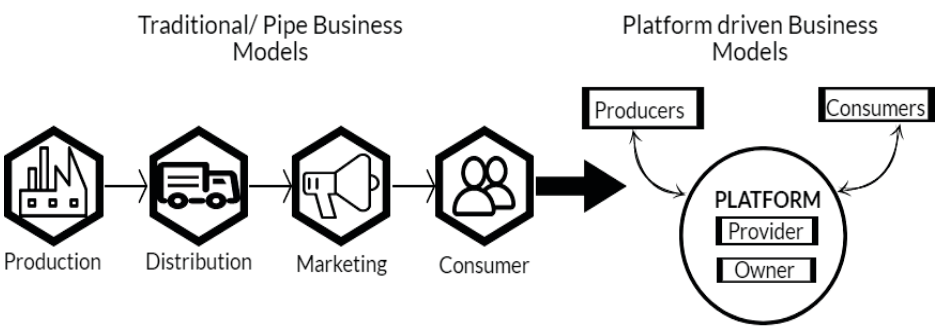
platform economy is the use of online platforms, which decreases the transaction costs of labour outsourcing and temporary access to goods and services (Drahokoupil and Fabo, 2016). Platform also represents infrastructure-based strategies for presenting friction into networks (Cohen, 2017).

Van Alstyne et al. (2016) and Evans (2003a) described a platform as a provider of infrastructure and rules for a marketplace that brings producers and consumers together. Furthermore, platforms allow the consumers to become the 'prosumers' to offer not only goods but also services as Ola consumers can also join the platform as a driver and provide transportation services. For platforms, the information and interaction are the main assets which ultimately create value for a company and provide a competitive advantage over other competitors prevailing in the market (Van Alstyne et al., 2016). Platforms also take a central role as payment service providers (Farrell, 2018) and reputation system provider. The payment service provider is one taking care of the process of transferring payments from customer to the supplier and reputation system provider evaluate the performance of both the parties with the help of ratings and reviews. For example, Ola evaluates both the parties that are driver and the rider via ratings.

The platform economy is said to get an end to 'markets for lemons'. The users will not have to purchase the used product which later turns out to be poorly serviced. Now, when the platform provides rating to the service provider, the incompetent and unskilled labour, or wanting electrician can no longer be providing services. Additionally, 'real-life profiles' on social media introduce innovative checks and balances (Scholz, 2014). It can be argued that if the platform operator only limits its role to facilitating a consumer and a supplier, the platform operator may still have some more duties as part of the intermediary. The duties can be meeting of pre-contractual information duties about the goods and services presented by the platform; duty to work as a communicator of quality, offered services and many more between the parties without any delay; duty to provide appropriate business environment for supplier to operate.

The platform can become the leader by extending beyond its own firm. The firm can aim to become the leader by building and sustaining the ecosystem of partners in which the platform leader become the captain (Evans and Gawer, 2016). The ecosystems encourage economies of scale through interactions to build better businesses not the volume. “Platform-enabled connected interactions” are at the centre of the ecosystem. The composition of connections enriches the value of ecosystem and built a community of trust (Nichol, 2016).

The platforms are usually situated within broader eco systems of firm, government, regulation and other institutions (Evans and Schmalensee, 2016). However, all the platforms have same basic structure and players in an ecosystem. The players are the owners, the providers, the producers and the consumers.



Source: Compiled by the authors

Figure 1: Traditional/Pipe business models vs. Platform driven business models

Figure 1 explains the platform ecosystem with respect to Myntra, a company selling lifestyle products in India. For Myntra, the owners are the one who control their intellectual properties and governance which is Flipkart[1]. So, all the rights and control of the intellectual property is with Flipkart. The providers serve as the platforms' interface users which is Myntra app running on mobile devices, desktop and any other electronic devices. The provider is connecting producers and the customers. The producers are the creator of the offerings which are vendors' providing different products to customers. The consumers are the one who uses the offerings. The platform and the producers as well and consumers are continuously exchanges the value, the data and the feedback.

There were few questions regarding the governance of the platform ecosystem like how to divide value between ecosystem participants, who have access to the platform, how to solve the conflicts or how to manage diversified objectives of each participant. The main aim of platform is to create and sustain vibrant ecosystems. At the same time, the policies must ensure the creation of value and participation on the platform which can be increased by providing the right mix of incentives to inspire new joining and encouraging good behaviour of the participants.

In today's scenario, the companies based on platform hire approx. 1.3 million employees with market capitalization of $4.3 trillion by building platform ecosystems a critical constituent of corporate strategy. Successful business leaders appreciate the importance of platform-based ecosystems which are reshaping traditional business models as well as building new value (Nichol, 2016).

Several researchers have given different labels to this platform economy based on their perceived attributes, viz. sharing economy, creative economy, peer to peer economy, on-demand economy, gig economy, the Precariat or sometime 1099 Economy, collaborative sharing economy among others. These names were given according to the perceived booster of the digital platform (Kenney and Zysman, 2016; Drahokoupil and Fabo, 2016).

Transformation of markets: From Pipe business model to Platforms business model

Starting from the industrial-era economy, the mean for undertakings of any barter or exchange was market. The market became an ideal place of transaction between buyers and sellers in which the price, quality, quantity, and characteristics of goods and services were regulated by the laws of demand and supply. Now, in the emerging economy, the locus for those undertakings is the platform where interactions are algorithmically as well as materially intermediated (Cohen, 2017)

The traditional way of business known as the pipe business has dominated the industry for centuries. However, with the advent of information technology, the requirement to own the physical structure and assets has significantly reduced. Since the digital platforms are diverse in nature, structure, and function, hence, the platform is also known as the digital form of the pipe business.

In traditional pipe business model, the flow of value is linear from a producer to consumer. Over the years manufacturing and service sectors have followed the pipe business model (Van Alstyne et al., 2016). However, a new concept of platform is the plug-and-play infrastructure that enables and harnesses this network flow of value.

Table 1: Pipe business model vs. Platform business model

Features	Pipe Business Model	Platform Business Model
Focus	Growing sales	Maximum exchanges and interactions on their platform
Direction	One way and Linear	Two-way and Continuous
Interaction	Direct interaction with the consumer	Indirect interaction among providers and users
Network	Create Network effect	Face networking problems and service provider may suffer
Governance	More about creating barriers	Provide flexibilities to the parties
Value	Maximize the lifetime value of individual customer	Maximize the value of an growing ecosystem.
Resource control	Firm hold the resources - tangible and intangible assets	Network of producers and the consumer are the chief resource or asset
Optimisation	Internal optimisation	External orientation and optimisation

1 In 2014 Myntra was acquired by Flipkart in an estimated Rs 2,000 crore deal. (Source:https://www.gadgetsnow.com/tech-news/Flipkart-acquires Myntra/articleshow/35472797.cms accessed on May 2, 2018.

Table 1 depicts the features of pipe and platform business models regarding eight parameters viz. focus, direction, interaction, network, governance, value, resource control, and optimization.

Managers of traditional businesses emphasis on increasing sales because for them the goods and services supplied are the units of analysis. The major concerns are the revenues and profit generated from sales. However, the focus shifts to collaborations with intermediaries and the exchanges of value between producers and consumers on the platform by the new business model.

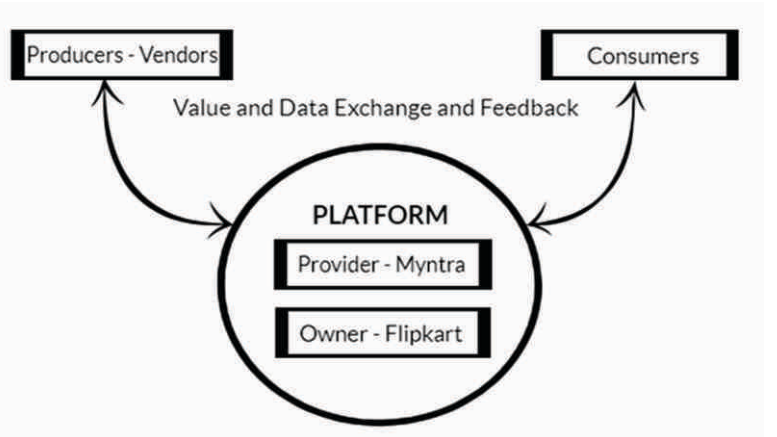


Figure 2: Myntra Platform Ecosystem

Source: Compiled by the authors

Figure 2 shows that in the pipe business model, the process from production to distribution, marketing and finally reaching to the customer is linear in nature and shows the one-way process. The platform business model is two-way directions from the platform to the whole platform ecosystem.

In the pipe business model the network effect can be created, but they would not face much problem as the pipe model is the one-way model. However, in a platform, sometimes the service provider may face the network effect as the positive network effect can convert into negative network effect. For the platform, the number of interactions and the related network effects are the ultimate source of competitive advantage.

In a pipeline business model the strategy circles around erecting barriers. In the platform business model, the emphasis of strategy moves to abolish barriers to production and consumption to create value for participants. However, the platform administrators must make two important decisions about whom to allow on the platform and what are they allowed to do on the platform.

In the pipe business model, the resource-based view of competition includes tangible assets like infrastructure, mines and many more and intangible assets like patents, rights, and other intellectual properties. However, in the platform business model, the assets are hard to copy as they mostly include the community and the resources which members of platform own and contribute. So, for platform businesses the network of producers and consumers act as a chief asset.

Pipeline firms organize their internal resources for value creation by improving an entire chain of product activities. However, value creation is been done by facilitating interactions between external producers and consumers in the platform. Apart from maximizing the lifetime value of customers, the platforms seek to maximize the overall value of a growing ecosystem by feedback-driven and iterative process. Occasionally it requires subsidizing some type of customer to appeal to another type.

Thus, the difference between the traditional businesses and platform businesses become more visible because of the higher flexibility and fragmentation of work, shifting the way of monitoring the work, strategies for recruitment, and the need for skills and training (De Groen et al., 2017). The platform as a facilitator also transformed from the one-sided platform to multi-sided platform as discussed below.

Ancient Roots: One-sided and Two-sided market

A one-sided market is a market that derives most of its value from a single class of users. In this type of market, users can get benefit from networking with a same group of users. For example, instant messaging, in which everyone can receive as well as send messages to each other and the communication is on one to one basis.

Another type of market is a two-sided market, where the network markets are encompassed of two discrete groups of participants. In this type of market, both groups are required to provide value for the network to operate, for example, Dineout, a table reservation service provider for restaurants. There are restaurants, and there are diners who have joined this reservation platform. At any point of time, some of the diners are looking for reservation ad some of the restaurants have tables available. Dineout as a platform having the software and database matches the restaurants and diners. Hence, in other words, in two-sided markets, the user can get benefits from networking with a separate as well as the complementary group of users.

It is often observed that companies use both one-sided and two-sided markets simultaneously to enhance their business. Two prominent competitors in food retail in India viz. Place of origin and Food memories are the example of these strategies. They bring unique regional delicacies from the most iconic and original producers from all over India at the doorstep of customers. It is a two-sided market model as they bring products from the smallest corners of the country to the largest cities. However, for some products like sweets and snacks, they bought at a wholesale price and sold for a retail price in their brick and mortal store which is known as a one-sided model. This distinction frequently rests on the decisions of the intermediary rather than only on technological attributes of the market.

One step ahead: Multi-sided market

There is no consensus on among organizations and academicians on which characteristics a market must have to be defined as a multi-sided market. However, in broad terms, it is typically a market serve two or more distinct sets of users, all of whom benefit from having each other on the platform (Hagiu, 2009; Hagiu and Wright, 2015). It involves more players in which each player has its interests to be served. While a firm that is active in a multi-sided market generally serves at least two distinct customer groups (which constitute the different 'sides' of the market), most definitions specify that indirect network effects are present amongst those two or more customer groups. The existence of those indirect network effects affects the mechanism of price setting and competitive interaction in markets.

Hence, multi-sided markets are in nature interdependent. For example, Justdial is a multi-sided platform providing different services including hotel booking, cab booking, flight booking and on-demand services like air conditioner repairing or car cleaning, etc. It also provides online booking of the train, bus, hotel, etc. Addition to that it provides online shopping for books, grocery, flowers, food, medicine, etc. In short, it consists of different sides of the market by providing all the different types of services to the consumers at one place.

There are three types of multi-sided platforms (a) Market-Makers: facilitate members of different groups to transact with each other; (b) Audience-Makers: match advertisers to audiences; and, (c) Demand-Coordinators: create goods and services which produce indirect network effects across two or more groups (Evans, 2003b).

Multidimensional Network effects

A network can be defined as a means of organization in which hubs and nodes facilitate the movements of interaction and transactions (Cohen, 2017). The multi-sided platform has led to study the role of network effect more closely as it is one of the distinctive features of platforms (Busch et al, 2016). From the very beginning markets and the economy remain supply-side economies of scale. The extensive fixed costs and less marginal cost help the firm achieving higher sales volume than its competitors. The supply side economy allows firms to decrease prices which raise the volume and cut the price more and more which ultimately leads to monopolies. However, the driving force behind the internet economy or the digital economy is the demand side economies of scale which is known as network effect (Van Alstyne et al., 2016).

There can be two types of network effects, Direct network effects arise when the value of connecting with the platform for the individual increases with the number of users and indirect network effects arise where one side of platform users attract more users on the other side of the platform (Busch et al, 2016). The network effects create the efficiencies in social networking, app development, and demand aggregation. Here in the digital economy, the form can achieve higher volume by making larger networks which

attracts more participants, and more value can be created by greater sale. For example; E-commerce site like Flipkart grew in popularity as more vendors associated with those marketplaces and sold their products to the consumers who began to embrace shopping online. Flipkart connects those participants by generating value for both the sides. So, when the number of participants increases, the value increases which is known as network effects and the network effect is the central part of the platform strategy.

Platform Economy in Indian Market

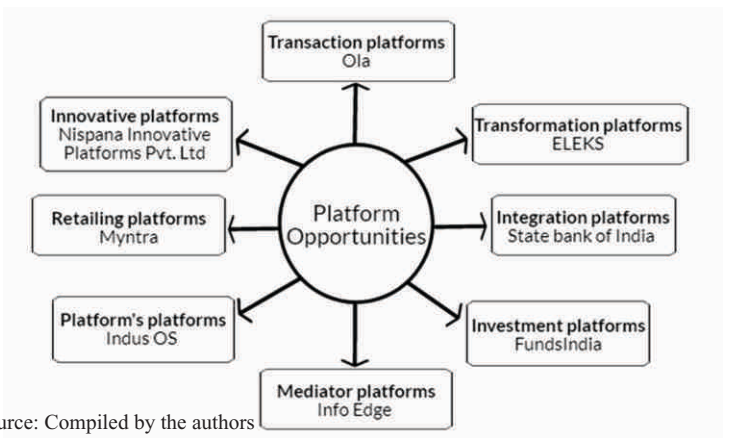
Evans and Gawer (2016) identified four major categories of platforms namely innovative platform, transaction platform, integration platforms and investment platforms. Platforms are often categorised in different segments in literature. In addition, these categories are discussed with relevant examples from Indian business.

Innovation platforms: An innovation platform is a technology, product or service that serves as a foundation on top of which other firms develop complementary technologies, products or services. For example, Nispana Innovative Platforms Pvt. Ltd, an international business intelligence solutions provider offers real time and competitive B2B platforms to business leaders around the world through integrated practice areas like strategic conferences, leadership forums, B2B summits, in-company training, professional training, and B2B exhibitions. Their partnership programs like B2B summits, conferences and exhibitions encourage complementary invention and leverage the indirect network effects to generate value to all participants of that platform eco-system.

Transaction platforms: A transaction platform is a technology, product or service that acts as an intermediary by facilitating the exchange or transactions between different users, buyers, or suppliers. So, transaction platform assist individuals and institutions to find each other, such as Flipkart and Ola, among others. Ola provides a platform to the drivers, the individual customers as well as the group of customers to find each other. Ola integrates city transportation for customers and driver partners onto a mobile technology platform ensuring convenient, transparent and quick service fulfilment.

Integration platforms: Integration platform can be a technology, product, or service that is a combination of transaction platform and an innovation platform. For example, State Bank of India (SBI) introduced India's first integrated lifestyle and banking service platform named YONO (You Only Need One). The platform includes products and different offers from around 60 e-commerce players like Amazon, Ola, Uber, Myntra, Cox and Kings, Yatra, Swiggy, Thomas Cook and others by leveraging analytics combined with a range of banking and financial services.

Investment platforms: Investment platforms consist of companies that have developed a portfolio strategy and act as a holding company of the portfolio and active platform investor or both. So, investment platform provide the financial services to the users on online portal. As India's friendliest online only investment platform, FundsIndia gives access of different financial instruments to investors. Those instruments include mutual funds, stocks, corporate fixed deposits and various other investment products, all in one appropriate online site. These types of platforms can help the investors to get real time financial data at their convenience and help them to invest in any financial instrument.



Source: Compiled by the authors

Figure 3: Platforms in Indian market

However, Figure 3 describes few more categories of platforms identified in Indian context which are discussed further.

Platform's platform: Platform's platform means the internet itself is the substance of the platform economy. For example, Indus OS, an Indian mobile operating system has transformed the mobile industry by presenting the World's First Regional Operating System. It is an operating system platform for smartphones on which enormous ecosystems have been built. In addition, there are companies providing infrastructure and tools for the rest. Indus OS provide the platform to publish their app on that operating system.

Mediator platform: Mediator platform is the one which plays a significant role by providing services as a mediator to all the parties. Platforms mediate work in several ways. For example, Info Edge, India's premier online classifieds company in recruitment, matrimony, real estate, education and related services. As a mediator platform, Info Edge bridges the gap between job seeker and job providers, home seekers and home developers, also helps to find out life partners through matchmaking services and many more.

Transformation platform

Transformation platform includes the platforms which have transformed the service industry by making the tools and techniques available on online portal which were not there in traditional business system. For example, ELEKS, Software Engineering Company turns out to be the provider of open source software platforms of all categories. This company provides expert software engineering and consultancy services to businesses on online portal. They also provide other services like product development, product vision, business goals, quality, and user experience and technology innovation.

Retailing platform: Retailing platforms are those which provide virtual market for the individual customers. Example of this type of platform is Lenskart, a leading e-commerce portal for eyewear in India. Lenskart provides 3D trial of eyewear to the individuals. Therefore, easy and hassle free demonstration of products can be done for retail customers

The above discussed platforms have modified the prevalent organization of economic undertakings by rearranging the entry barriers, repackaging work, shifting to value creation and repositioning power in the economic and network structure. It is very much important to understand that all the above examples can be used interchangeably for other platforms due to the dynamic nature of the economy and business.

Consequences – disruption of economic activities

The "Internet of Things" is offering innovative services and improved applications based on the knowledge about the environment and the individuals within (Bohli et al., 2009). Combining it with Platform economy, many businesses came into presence, forming a highly fragmented market with new business opportunities and strategies to offer products and services to different groups of customers. Many studies have revealed that the digital transformation will outspread the "Internet of Things" and beyond which is simply a starting point and likely to release massive creativeness, but also with few challenges to management.

First, work is being reformatted by platform economy which has a negative impact on the labour market. The wider application of new technologies such as data analytics, artificial intelligence, 3D printing, cloud computing, Internet of things (IoT) and robotics are changing the labour markets (De Groen et al., 2017). The traditional employment means a single business providing a long-standing commitment to the employee with some social benefits. This commitment and benefit are giving way by the gig or these contract arrangements. As the business can have the better strategy with the low margin and low price, they can provide higher wages and other benefits to the workers which strengthened the competitive position of the firm (Kenney and Zysman, 2016). Thus, the shift from conventional pipe business model to the platform business model may powerfully modify the dissemination of income and wealth in whole society. The platform business can generate scattered work schedules as well as increases the levels of part-time work deprived of the employment-related benefits that earlier categorized in full-time work.

Secondly, there has been an outburst of articles and books from economics in disagreement that traditional jobs will be displaced by new digital automation and robotics. According to the World Development Report 2016, on an average 66 percent of all jobs could be in hazard because of automation in developing nations in next decades. In India, the estimated part of jobs at risk due to automation is 69 percent. So, the digital machines, artificial intelligence, robots and others will shift work for the entire population (Davidow and Malone, 2014).

Thirdly, there is a typical dilemma in the usage of digital automation which means anything if it can be considered appropriately computable, can be copied. This indicates that an additional round of revolution and imagination is needed. However, the digital machine can duplicate intelligence; but it does not create the perception nor does it consider whether human perception varies in fundamental ways from current algorithmic tools.

Fourthly, the problem can be related to the emergence of Monopoly market. Many platforms prove to be 'winner-take-all models' where only one or at max two platforms survive. For example UrbanPro, a network providing a platform to students and professionals, trainers and others like tutors for photography, language learning, musical instruments, etc. There were other platforms providing identical services like TryMyTutor, Flipclass and many more. However, Urbanpro maintained its position as India's largest learning provider. The portion of the value created by the company is massive in aggregation. The platform owner can be benefitted by getting a portion of the complete value created by all the participants on that platform (Kenney and Zysman, 2016). Most importantly the power is consolidated to the platform owner who becomes a monopolist after captivating the preliminary competition and can make decisions for own welfare rather than the participants of that platform.

Lastly, due to the change in the working of the current market structure, the policies and rules need to be revised. There is list of policy domains like taxation rules, competition policy, intellectual property rules and service provision requirements which needs to be taken care of in the era of platform economy (Kenney and Zysman, 2016). One needs to evaluate the present policies by considering the likely burden for policy amendment created by platform participants. Most significantly, the old rules and values need to be changed according to this new era of platform economy. As platforms nurture new challenges and issues about the market power and the capability to incorporate position in one market to another, it is impossible to carry the same values of any era to the other.

Implication for Business and Research

As can be seen from the previous discussion, there are several consequences and disruptions of economic activities due to the emergence of platforms. However, organisations are apprehending new opportunities and modifying the way of doing business through different platforms. Implications of the same for business and research are discussed below.

Business Implication

The different type of platforms discussed earlier is useful for expanding the scope of business in this new and emerging platform economy. Traditional pipe business model needs to adapt platform business models to have a competitive advantage by achieving economies of scale and scope. Company having dominance in one-side or two-side markets can expand the horizon with multi-sided platform market by catering to more participants. Many companies have successfully done that in past and their strategies are still gaining importance in today's world. The above example can help the business to understand their strategy and how they adapt the platform business model to have competitive edge over other. The decision regarding adaption of platform business model is entirely rely on the business and its owners. However, from all practical examples one can conclude that platform economy have changed the nature of business in market and is going to change further.

Research Implication

Evaluation research is a significant element of any change intervention. The primary implication of the research is a better understanding of the platform economy and its emergence. The research will encompass the benefits to government to promote different type of platforms which direct the growth of economy. The research will enable the society to take a paradigm shift from the traditional pipe business model to platform business model by taking in to consider the benefit of platform business model.

Conclusion

After the industrial revolution, one of the major break-throughs in the global macro-economic environment is platform economy. The technology is core for the success of any platform business. However, building a successful platform will require the building of large complex IT systems, machine learning and advanced artificial intelligence. While considering the Indian market, the platform is in infant stage but it has potential to grow in future. In today's time, majority of successful companies' ground breaking revolutions are neither products nor services which they are providing, but they are the platforms. As discussed above, platform work as a mediator and a facilitator which built the gap between consumer and producer by changing the way of running business in recent times. The platform ecosystem plays an important role as a value creator for all the participants in the digital economy. The platform business models has redesigned the work in

terms of providing entertainment, consumption of goods and services, finance assistance, information transmission, social interaction which was previously mediated by different locally embedded systems. By taking aggregate level scenarios, many of the platform-based businesses are unsuccessful, but the platform business model is an undisputable commercial success for many of them. So, apart from above consequences and challenges, the technological driven businesses and the born digital businesses have successfully become proficient in platform strategies. Now, these opportunities are opening up to each enterprise in all industry.

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Effect of Valuation and Growth: Stock Market Returns

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Abstract

This study attempts to explore the ability of value investment and growth investment philosophies to predict the stock market returns. It analyses the explanatory power of the price- earnings ratio and EPS growth in stock market returns. The BSE Sensex data for the period of twenty years, starting from 1998 is taken for the study. Index return is selected as the dependent variable and Price-earnings ratio, Price to book ratio and EPS growth are taken as the independent variables. Data analysis is done using correlation and multiple regression. The important findings of the study are market returns are negatively correlated with price earnings and price to book ratios Market returns are positively correlated with EPS growth. Out of these ratios, PE ratio and EPS growth have more explanatory power in market returns.

Keywords: *EPS Growth, Growth Investment, PB Ratio, PE Ratio, Value investment*

JEL Code: G11, G12

Generating a superior return is the most important objective behind any investment. Historically, investment in equities outperformed any other asset classes. But the beneficiaries of the market returns are relatively a few. Greed for big returns many times leads to wealth destruction, instead of wealth creation. Making money from stock market requires patience and discipline along with a sound understanding of the market.

Investment in equities means owning a part of the company. Ultimately the stock return depends upon the financial performance of the company. This is one fundamental aspect that investors should be aware of. Companies rewarded the shareholders with handsome returns in long term. They backed were by consistent financial performance. Understanding the business, its current performance and prospects are an inevitable part of equity research. Equity researchers will be keen to analyse a wide variety of accounting variables like price earnings ratio, price to book value, Earnings growth, debt - equity ratio etc. to assess the financial fundamentals of the company. People who made significant wealth from the stock market gave emphasis to various aspects of fundamental analysis and they were successful in implementing it. Each individual investor needs to develop his own investment style to become successful in equity investment.

Value investment and growth investment are two important investment philosophies popularized by eminent investment gurus. Benjamin Graham is known as the father of value investing. Benjamin Graham and David Dodd (Security Analysis, 1962) argued that buying companies close to their intrinsic value based on tangible assets, earnings and financial strength, ensure a superior return to shareholders. Buying below intrinsic value provides a margin of safety which acts as a cushion against unfavourable market conditions. This philosophy is known as the value investment. This investment style was further popularized by the legendary investor Warren Buffet. Buffet surprised the investment world through his acumen to pick value stocks. This enhanced the fan following for value investment style. Thomas Rowe Price Jr. who is known as the father of growth investment believed that superior market returns are possible when investors buy well - managed companies in growing industries whose earnings and dividends are expected to grow faster than inflation, economy and industry. This is the underlying principle behind growth investment. Philip Fisher (Common Stocks and Uncommon Profits,1997) emphasized on the role of earnings growth in achieving a superior return and argued that it can be attained by investing in growth companies. Peter Lynch (One Up on Wall Street,1989) introduced a hybrid model which combines both value and growth investment philosophies. This investment style is known as GARP (Growth at Reasonable Price) Strategy. Here the focus is on selecting fundamentally good growing companies at a reasonable valuation. All the above-mentioned investment styles are revolving around two broad fundamental aspects of valuation and growth. Which of them has more explanatory power on stock market returns is still debatable.

Objectives

- To assess the ability of price earnings ratio to forecast return in Indian capital market,
- To evaluate the role of earnings growth in predicting the stock market return in India, and
- To develop a model to predict the market return.

Scope of the Study

Global markets are very closely connected with each other in modern days. A macro-economic data in the USA will have an impact on emerging markets and vice versa. This interlink provides opportunities and at the same time throws the challenge to the international investors. As the market is getting connected more efficiently, the investment philosophies also will have a universal application.

This research is focused on assessing the effect of price earnings ratio and earnings growth on the BSE Sensex returns. BSE Sensex comprises of 30 stocks from different sectors which reflect the broad market behaviour.

The period selected for the study is twenty years between 1998 and 2018. The market has faced multiple financial crises in this period like dot com bubble of 2000 and global financial crisis of 2008. The study is expected to assess the predictability of market meltdown based on trends in valuation and earnings growth.

Literature Review

Both academic and investment world exhibited a keen interest in understanding the fundamental accounting variables which influence stock market return. Many studies were conducted globally, and the results were not conclusive across different geographies and period.

Sanjoy Basu (1983) evaluated the relationship between earnings yield, market value and return using the stocks listed in NYSE. For this purpose, he constructed two portfolios using earnings yield and firm size keeping one constant. The returns of the stock listed in NYSE had relation with earnings yield and firm size. The firms with higher earnings yield and smaller size generated higher returns.

Fama and French (1992) are considered as pioneers who conducted research in factors influencing stock returns. The major finding was that for the 1963–1990 period, size and book - to - market equity capture the cross - sectional variation in average stock returns.

Golob and Bishop (1997) analysed US markets long term performance in relation with dividend yield, profit growth and Price Carnings ratio. It explains how PE Ratio will influence stock market return. Scott and Miller (1997) studied the performance of value stocks and growth stocks for a time period of 14 years on a risk - adjusted and total return basis. The research found that value stocks outperformed growth stocks over this period. This can be attributed to the underestimation of Value stock EPS and overestimation of growth stock EPS.

Dhatt et al., (1999) studied the relations between stock returns and fundamental variables in the Korean market. Correlation and regression analysis were used to interpret the data. The study concluded that returns of the Korean market in general and stocks selected, are significantly correlated to book to market, sales – price and debt - equity ratios but not related to market capitalization. Among the different variables book to market has greater explanatory power to market returns. This proves that the value stocks generate higher returns.

Levent Akdeniz et al., (2000) explored the impact of beta, firm size, book to market and earnings yield ratios on stock returns in the Istanbul stock exchange. They followed the Fama and French model and selected nonfinancial companies listed in Istanbul stock exchange between 1992 to 1998. The study identified that stock returns vary directly with the book to market ratios, inversely with firm size and market beta has no effect at all. Xavier (2001) explored the correlation between risk and market value to explain premium obtained by investment strategy from the Japanese market.

Vivek Bhargava and D. K. Malhotra (2006) evaluated the relation between PE ratios and stock values in world indices like S&P 500, MSCI World, MSCI Europe, and EAFE indexes. VECM and VAR methods are used to explore the relation, and Granger causality is used to test whether the relation is causal. The study finds that subsequent prices will increase and subsequent yields will decline in response to an increase in the P/E ratio.

Kelly et al., (2008) examined the relationship between the market returns of Australian stocks and their P/E ratios in an effort to unearth probable P/E based trading strategy. The excess and differential returns of P/E ranked portfolios containing 1310 Industrial firms over a 9-year period (January 1998 to December 2006) were examined. The results showed the existence of a low P/E effect in the Australian capital market.

Tze San Ong et al., (2010) studied the predictability power of PE ratios in the Malaysian stock market index. The objective behind the study was to investigate whether the bear market can be predicted using PE valuation of the index. They adopted methods commonly followed by investment analysts like fundamental analysis and financial market theory. The finding of this research was against the common belief that an elevated level of PE will lead to falling in the stock market returns. The Kuala Lumpur Composite Index (KLCI) has shown an increasing trend in return along with an increase in PE valuation.

Chichernea et al., (2012) explored the relationship of market return with accrual quality and book to market ratios. The study was conducted using univariate, multivariate cross-sectional tests and Fama-MacBeth regressions. The analysis was conducted on the overall sample, specifically on up and down market conditions. The finding was, value (growth) stocks are more likely to be associated with high (low) accrual quality. The returns generated by value stocks will be superior in down market conditions while poor accrual quality firms will have a superior return in upmarket conditions.

Jaspal Singh and Kiranpreet Kaur (2014) used the fundamentals-based investment strategy "F-score," given by Joseph Piotroski to differentiate the value stocks (stocks with a high book to market ratio). The result shows that the mean market-adjusted return of stocks meeting all constructs of F-score is significantly larger than the entire portfolio of value stocks by 18.40 per cent annually across the period of study.

Osad and Gabriel (2014) studied on the application of Fama and French three-factor model on Nigerian stock market. Monthly excess portfolio returns were regressed on excess market returns, firm size and book-to-market-equity ratio using time series regression analysis. The results obtained from the analysis revealed significant relationships between expected portfolio returns and excess stock market returns, firm size, and book-to-market equity factors. The study supports the applicability of Fama and French three-factor model in Nigerian stock market.

A, Balakrishnan (2016) examined the effect of size, value, and momentum on stock returns. The Study concluded that Capital Asset Pricing Model does not capture average returns on portfolios. Fama–French three-factor model partly explains average returns on size–value sorted portfolios while Carhart four-factor model captures returns on size–momentum sorted portfolios mainly small size-winner portfolio. Hence, size, value and momentum factors continue to exist in the Indian stock market and they are found to be profitable investment strategies which would maximize invested wealth of the investors.

Singh et al., (2016) conducted research on expected stock returns on Indian capital market based on the capital asset pricing model. The result shows that the average market returns for the period under study were 16.46% whereas the cost of equity was 13.47%. The study shows that the Indian market is an attractive investment destination which rewards shareholders with returns exceeding the expectation.

T. G. Saji and S. Harikumar (2016) explored the existence of value premium in the Indian market. The methodology used was an exploratory factor analysis and a regression modeling under Ordinary Least Square (OLS) method. Exploratory factor analysis identified earnings growth and Earnings Price (E/P) rate as the leading determining factor of stock returns. Expected earnings growth expressively described E/P rate under OLS regression framework. The study then appraised normal E/P rate for the individual stock and compared the same with the actual E/P. If the actual E/P for a particular stock was greater than its estimated E/P, it was inferred that the stock was undervalued, the opposite being the case for overvaluation.

Jiao and Lilti (2017) observed that Fama and French five-factor model explanatory power has differences in a separate set of portfolios created in the Chinese stock market. The newly added profitability and investment factors in Fama and French five-factor model seemingly not captured any additional variations in returns.

Methodology

The study is conducted on Bombay stock exchange's index, Sensex for a period of 20 years starting from 1998. Valuation and growth are selected as two fundamental factors influencing the performance of the stock market. The stock market performance is assessed using the performance of BSE Sensex which comprises 30 stocks representing various sectors.

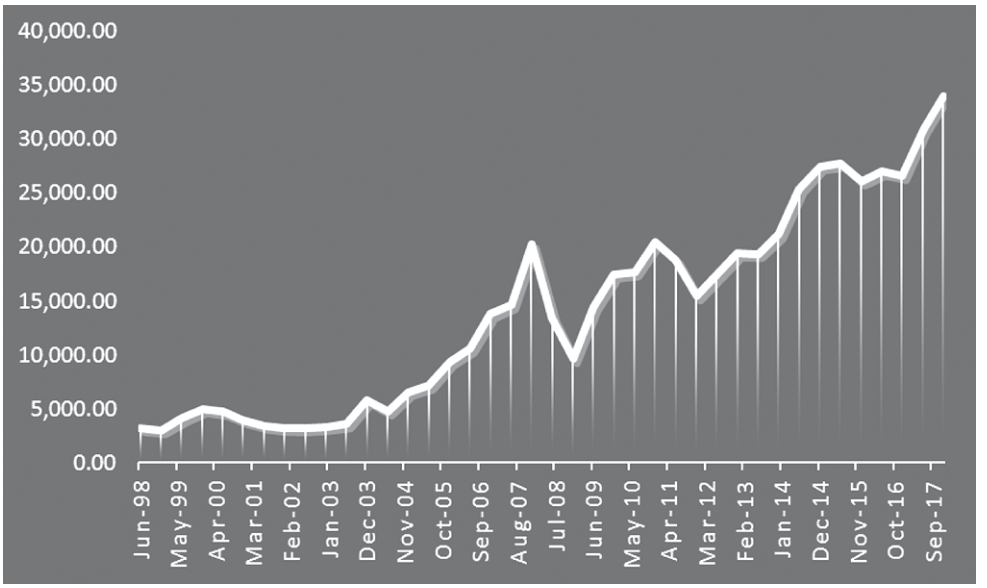
Price-earnings ratio and Price to book value are the ratios used to address valuation aspect. Price earnings ratio is the relationship between market price and earnings per share. This ratio shows the market price of the share is trading at how many times of earnings per share. The relatively higher PE ratio is a signal of overvaluation and vice versa. Price to book value is another ratio used to assess the valuation of share. It is the relationship between the market price of a share and its book value. Similarly, a higher PB ratio is also interpreted as a sign of overvaluation.

The growth aspect of the market is captured using the growth in the earnings per share. The relationship between earnings growth and market returns are analyzed in the study.

The market returns are possible either by expansion in valuation or by growth in earnings. Each of this argument is owned by the followers of value investment and growth investment.

To find out which factor/s has/have more explanatory power, the index readings for twenty years starting from 1998 is taken along with index PE, PB ratios and index EPS growth. June and December Month closing reading is taken for the study Annual return is calculated using 12 month period basis. The corresponding valuation and growth ratios are considered to identify its influence in stock market return. The EPS growth of the corresponding period was also considered to explore the relation between eps growth and return. Multiple regression analysis is used for interpreting the data.

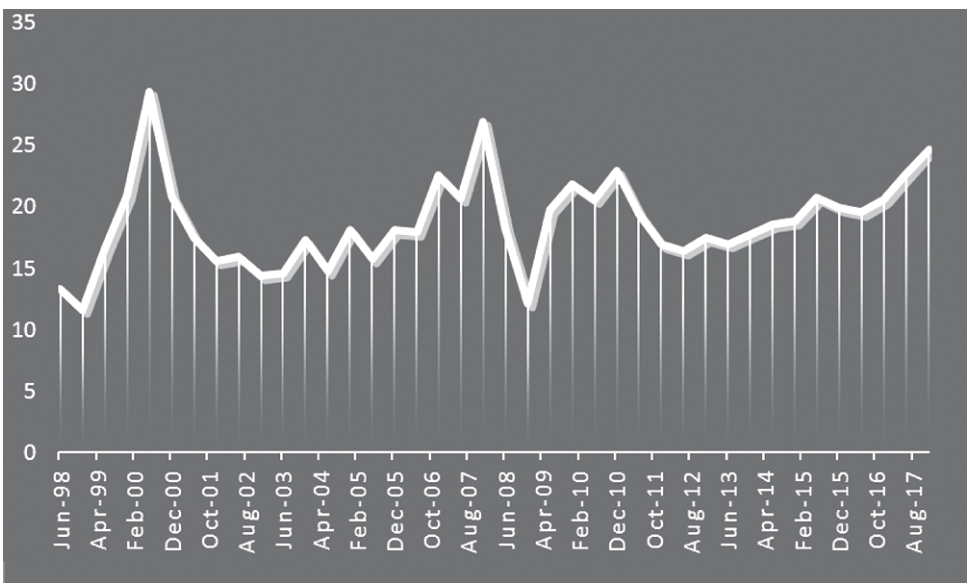
Data Analysis



Source: www.bseindia.com

Figure 1 BSE Sensex Historical index

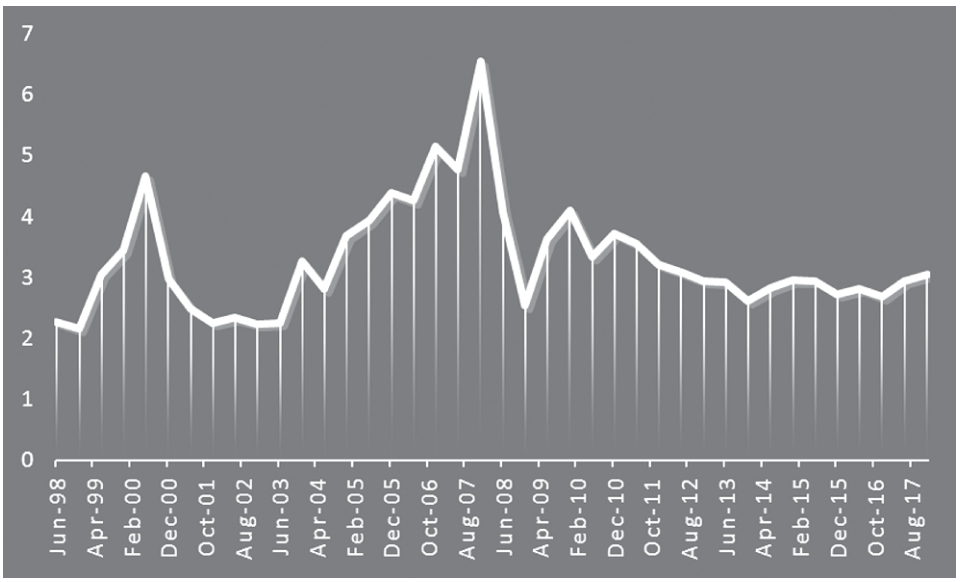
Figure1 shows the performance of BSE Sensex for the last 20 years starting from the year 1998. The Sensex has gone up from 4000 range in 1998 to 32900 in 2018 with a CAGR of 11.11 %. The economy has witnessed a phenomenal bull market in 2005-07 and subsequent bear market associated with the global financial crisis. The market has witnessed corrections of different magnitude in the reference period but long term trend exhibited, is in the upward direction. The investor's entry point in the market is also a significant factor which determines the expected return from the market.



Source: www.bseindia.com

Figure 2 BSE Sensex historical PE ratio

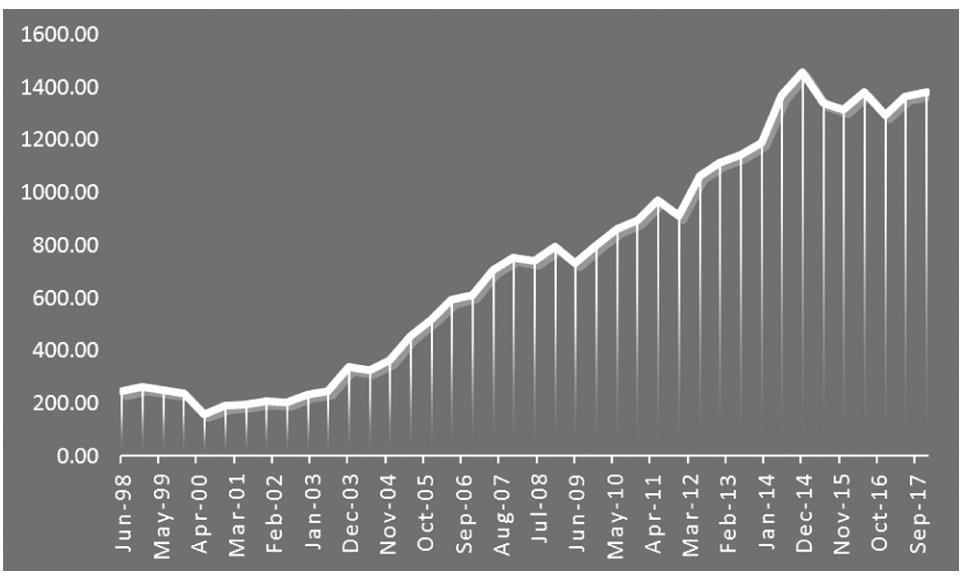
The PE of the index is referred for understating the over or undervaluation of the market. The average Sensex PE for the period under reference was 19. It reached the peak of 29 just before market crash due to dot com bubble. The PE of Sensex was the lowest in 1998 with the value of 11.65. The valuation tends to reach its bottom when pessimism is widespread in the market and abnormal valuation will be reached when the market is overly enthusiastic.



Source: www.bseindia.com

Figure 3 BSE Sensex Historical PB ratio

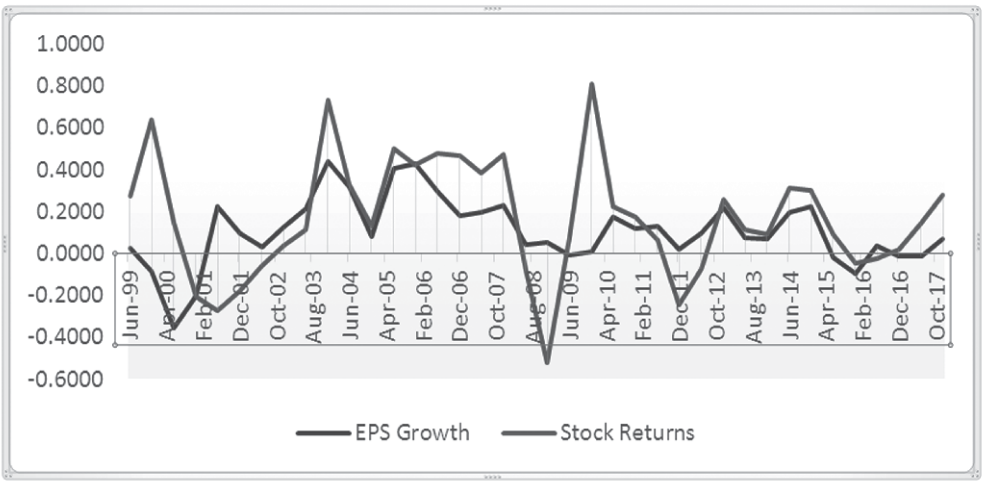
PB ratio is also considered as an indicator of valuation. The average PB ratio for the index for the period was 3.35. The PB ratio reached the maximum of 6.54 just before the market crash after the global financial crisis. Like PE ratio, the PB ratio also was lowest in Dec-98 with a value of 2.16.



Source: www.bseindia.com

Figure 4 BSE Sensex Historical EPS

Sensex EPS is the weighted average earnings per share of the component companies in Sensex. The average EPS of Sensex was Rs756 in the reference period. It reached the maximum of Rs 1459 in Dec 14. The lowest profitability of Sensex was reported in 2000 with Rs 161.58. The market value of a stock or index will increase by EPS growth, valuation expansion (PE) or both.



Source: www.bseindia.com

Figure 5 Annual EPS Growth and Sensex returns

The EPS growth and market returns are exhibiting a positive relationship even though the variation is not proportional. A change in EPS will have a directly proportional change in market return if the valuation (PE) remains constant. Changes in market valuation (PE) and variation in profitability result in disparity in market returns.

Regression Analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.814[a]	.662	.642	.17184	1.369

a. Predictors: (Constant), EPS, PE

b. Dependent Variable: Stock Returns

As a whole, the regression does a good job of modelling stock returns. More than half (66%) of the variation in stock returns is explained by the model.

ANOVA [a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.968	2	.984	33.325	.000[b]
	Residual	1.004	34	.030		
	Total	2.972	36			

a. Dependent Variable: Stock Returns

b. Predictors: (Constant), EPS Growth, PE

The ANOVA table reports a significant F statistic, indicating that using the model is better than guessing the mean.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.124	.152		7.400	.000					
	PE	-.056	.008	-.701	-7.013	.000	-.730	-.769	-.699	.994	1.006
	EPS Growth	.632	.175	.361	3.614	.001	.417	.527	.360	.994	1.006

a. Dependent Variable: Stock Returns

Here the model fit is positive, the first section of the coefficients table shows that PE and EPS are good predictors in the model because the significance levels are less than 1%. To determine the relative importance of the significant predictors, look at the standardized coefficients. Even though the PE has a small coefficient compared to EPS, PE actually contributes more to the model because it has a larger absolute standardized coefficient with a meagre standard error.

In the case of each of the predictors, the values of the partial and part correlations are either increased or having a very small difference from the zero-order correlation. This means, that the variance in stock returns that is explained by PE and EPS is more compared to other variables.

In the collinearity statistics also, the high tolerance values indicate that the chosen predictors are highly relevant in deciding the stock returns.

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	PE	EPS Growth
1	1	2.399	1.000	.01	.01	.07
	2	.584	2.027	.01	.01	.91
	3	.018	11.606	.99	.99	.02

a. Dependent Variable: Stock Returns

To see whether the Eigenvalue equal to 0.018 indicates inter-correlation among the predictors, the correlation matrix is examined and it is found that there is no correlation between the predictors as such.

Correlations

		Stock Returns	PE	EPS Growth
Pearson Correlation	Stock Returns	1.000	-.730	.417
	PE	-.730	1.000	-.079
	EPS Growth	.417	-.079	1.000
Sig. (1-tailed)	Stock Returns	.	.000	.005
	PE	.000	.	.322
	EPS Growth	.005	.322	.
N	Stock Returns	37	37	37
	PE	37	37	37
	EPS Growth	37	37	37

In view of the above and moreover, the assumptions underlying regression holds good, it is clear that the linear regression model developed in the study is appropriate for predicting the stock returns.

The coefficients in the model are b0=1.124, b1=-0.056 and b2=0.632

Hence, the regression model can be written as follows.

Stock Returns =1.124- (0.056 * PE) + (0.632 * EPS Growth)

Conclusion

The results of the study show that both valuation and growth philosophies have relevance in the BSE Sensex returns in the period of reference. Value investment philosophy advocates that investment at the time of lower valuation generates higher returns. As per the study Sensex returns are influenced by the PE ratio at the time of investment. Investment at the time of lower PE ratio of index tends to generate a superior return in comparison with investment at a higher PE ratio. In the valuation ratios, the PE ratio has more explanatory power than PB ratio. These findings are contrary to the findings of Vorek (2009) who found a positive relationship between PE and index return of major 50 stocks that trade on the Prague Stock Exchange in the Czech Republic, for the period of 2001 and 2008. But these findings are in accordance with the study findings of Basu (1977) which states that a lower PE ratio is normally followed by superior market performance. This study endorses the PE valuation of the market index as a predictive indicator of a bull market or bear market. Growth investment philosophy advocates for investment in companies who consistently exhibits growth in the EPS. This study reinforces the arguments in favour of growth investment philosophy. EPS growth has explanatory power in Sensex returns. Investment in companies or indices which are exhibiting superior growth will generate a higher return. The findings of the study support both value investing and growth investment philosophies. Identifying growing companies/indices and investing at lower valuations will ensure a higher return. This finding is in line with the GARP (Growth at Reasonable Price) model suggested by Peter Lynch (1989).

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Determinants of Capital Structure: Evidence from Listed Manufacturing Companies in Sri Lanka

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Abstract

This was an attempt to identify the determinants of capital structure of listed manufacturing companies in Sri Lanka. Panel data were extracted from 20 listed manufacturing companies from 2012-2016. Current study considered the profitability, tangibility, size, growth, liquidity, taxation and non debt tax shield as factors to determine the capital structure. Fixed effect model and random effect models were performed to examine the factors determining the capital structure of listed manufacturing companies in Sri Lanka. Hausman specification test was used to evaluate the best model from random and fixed effect models. Fixed effect model was considered as best model to explain the results: profitability, tangibility, size, liquidity and taxation as determinants of capital structure in terms of long term debt to total assets ratio and total debt to total assets ratio.

Keywords: *Capital structure, Determinants, Manufacturing companies*

Financing and investment are considered as two most important decision areas in a firm. The selection of capital structure has been one of the most critical and important strategic financial decisions of the firms. A company generally has two ways of financing their assets; either with stockholders' equity or / and with debt (Myers, 2001).The combination of debt and equity to finance firm's long-term assets is stated a capital structure of the firm. The capital structure is a crucial decision for all the firms as it affects the cost of capital and also the financial risk on it. Capital structure is important for the survival in the industry, growth and performance of the firm. There has been a growing concern worldwide in detecting the variables associated with debt leverage (Voulgaris, Asteriou, & Agiomirgianakis, 2004). In Sri Lanka the firms facing difficulty have to do more with the financing, whether to raise debt or equity capital, different firms with different capital structure feel appropriate, the different debt to equity mix ratios.

An appropriate capital structure is an important decision for any business organization. It is reasonably difficult to design specific general Optimal Capital Structure for the firms that maximize the firm value. If the organizations are financing through debt they have to pay the interest to the banks and if they are financing through equity they have to give the dividends to the shareholders from their profit and sometimes generate the retained earnings account that they did not distributed to the shareholders but reflecting their profit. Therefore, one of the most fundamental questions of research, has been whether there exists a unique combination of debt and equity capital which maximizes the firm value, known as the optimal capital structure and if so, then what factors could influence a firm's capital structure. The choice of capital structure has interested a number of researchers over the years and it has been one of the most broadly researched areas within corporate finance.

Many researchers have contributed to superior theories with empirical evidence on the determinants of capital structure such as Trade-off Theory, Pecking Order Theory and Agency Cost Theory. Based on these theories, many previous studies on the determinants of capital structure have found evidence of relations between some determinants and leverage. Such determinants are well documented in many other countries as Indonesia, Jordan, China, Nigeria, Bangladesh and Ghana. In Sri Lanka, for instance, Ajanthan's (2013) empirical research has found evidence that the profitability is confirmed to be a relevant determinant for Sri Lankan hotels and restaurant companies. Sangeetha and Sivathaasan (2013) exposed that firm size, growth rate and profitability are statistically significant determinants of capital structure. Empirical findings of Vijeyaratnam and Anandasayanan (2015) empirical findings shown the Profitability and Non debt tax shields are significantly associated with leverage. Pratheepan and Banda (2016) have also found that the firm size, profitability and growth significantly affect the leverage ratio. Many determinants have been found by previous studies in Sri Lanka. Even though, such studies may not represent the main determinants of capital structure which have been indicated in theory. Therefore, this study will give a comprehensive review of the main determinants of capital structure in each theory and how these determinants influence the leverage level, particularly on the aspects of manufacturing companies in Sri Lanka. Population of the listed manufacturing companies on CSE is 41 as at 31st December 2017. Though, based on the market capitalization top 20 companies are selected for the study. Therefore, present study carries out an empirical study, using panel data analysis, to determine the firm-specific factors affecting the capital structure decisions of listed Manufacturing companies in Sri Lanka. The present study attempts to fill in the gap on the determinants of capital structure in Sri Lanka, by re-visiting to examine the factors Determining capital structure decisions in Sri Lanka.

Review of Literature

Theoretical Review

Modigliani and Miller Propositions

The seminal work by Modigliani and Miller (1958) in capital structure provided a substantial boost in the development of the theoretical framework within which various theories were about to emerge in the future. Modigliani and Miller (1958) concluded to the broadly known theory of “Capital Structure Irrelevance” where financial leverage does not affect the firm's market value. However their theory was based on very restrictive assumptions that do not hold in the real world. These assumptions include perfect capital markets, homogenous expectations, no taxes, and no transaction costs. The presence of bankruptcy costs and favourable tax treatment of interest payments lead to the notion of an “optimal” capital structure which maximizes the value of the firm, or respectively minimizes its total cost of capital. Modigliani and Miller (1963) reviewed their earlier position by incorporating tax benefits as

determinants of the capital structure of firms. The key feature of taxation is that interest is a tax-deductible expense. A firm that pays taxes receives a partially offsetting interest "tax-shield" in the form of lower taxes paid. Therefore, as Modigliani and Miller (1963) propose, firms should use as much debt capital as possible in order to maximize their value.

Four contradictory theories of capital structure such as trade-off theory, pecking order theory, agency cost theory and market timing theories have been developed after the establishment of Modigliani and Miller's theory.

Trade-off Theory

The theory of trade-off was developed by Kraus and Litzenberger (1973). Trade-off theory explains that corporate should consider a reasonable debt and equity ratio to maximize firm value as debt is a cheap source of financing. This theory suggests that manager should strike a balance between the tax savings from increase in debt capital with the increase in probability of financial distress. Beattie , Goodacre and Smith (2004), in the trade-off theory, companies are said to operate with a target capital structure at which the costs and benefits of issuing debt are balanced. Thus, the trade-off theory established a theoretical framework for explaining the term "optimal capital structure" of the firms.

Credit ratings are essential for capital structure decisions, given discrete costs and benefits associated with different ratings levels. Kisgen (2006) suggests the credit ratings and capital structure hypothesis which credit ratings affect firm's capital structure decisions. The primary testable suggestion of credit ratings and capital structure hypothesis is that firms near a ratings change issue less net debt relative to net equity than firms not near a ratings change due to the discrete costs and benefits associated with different rating levels. The credit ratings and capital structure hypothesis can be explained in the situation of the tradeoff theory of capital structure. The tradeoff theory argues that a firm will balance the value of interest tax shields and other benefits of debt against the costs of bankruptcy and other costs of debt to determine an optimal level of leverage.

Pecking Order Theory

Pecking Order Theory states that firms have perfect hierarchy for financing decisions. The best first choice is to use internal financing which are retained earnings, and then issues debt securities if internal source fund is not sufficient to finance the firm and issue of equity is the last choice of financing the firm. Internal funds incur no flotation costs and require no supplementary admission of proprietary financial information that could show the way to more strict market regulation and possible losses of great competitive advantage (Rasiah & Kim, 2011). According to Myers (1984) firms must use external funds and he suggested that the first choice is to use the financing sources such as debt, convertible securities, preferred stock, and common stock.

Asymmetric information is deep-rooted in the pecking order theory, or the likelihood that a firm's managers know more about the company's financial condition and future growth opportunities than do outside investors. There are strong needs to keep such information appropriately. The use of internal funds prevents managers from having to make public disclosures about the company's investment opportunities and potential revenue to be realized from investing into them. The second supposition is that managers will proceed in the welfare of the company's existing shareholders. The managers may still give up or reject a positive NPV project. Consequently, it would require the issue of new equity or a large amount of capital, since this would give much of the project's value to new shareholders (Myers & Majluf, 1984).

Agency cost theory.

Debt financing may lead to agency costs. Agency costs are the costs that arise as a result of a principal-stakeholder relationship, such as the relationship between equity-holders or managers of the firm and debt holders. (Myers & Majluf, 1984) showed that, given the incentive for the firm to benefit equity-holders at the expense of debt holders, debt holders need to restrict and monitor the firm's behaviour. These contracting behaviours increase the cost of capital offered to the firm. Thus, firms with relatively higher agency costs due to the inherent conflict between the firm and the debt-holders should have lower levels of outside debt financing and leverage.

Market timing theory.

It is a theory of how firms and corporations in the economy choose whether to finance their investment with equity or with debt instruments. It is one of many such corporate finance theories, and is often contrasted with the pecking order theory and the trade-off theory. Baker and Wurgler (2002), state that market timing is the first order determinant of a corporation's capital structure use of debt and equity. A

complete market timing theory has to to explain why at the same moment in time some firms issue debt while other firms issue equity. As yet nobody has tried to explain this basic problem within a market timing model. The typical version of the market timing hypothesis is thus somewhat incomplete as a matter of theory.

Empirical Findings

Samarakoon (1999) investigates the capital structure of companies listed in the Colombo Stock Exchange. Results of the study reveal that the use of debt financing by Sri Lankan firms is significantly low while tangibility and growth opportunities are not associated with capital structure. Further, profitability and firm size are significantly correlated with leverage.

Booth et al. (2001) in ten developing countries, and Huang and Song (2002) in China, find that tangibility is negatively related to leverage. It is argued, however, that this relation depends on the type of debt. Antoniou, Guney and Paudyal (2002) argue that several studies find that the firm size is a good explanatory variable for its leverage ratio.

Bevan and Danbolt (2002) also argue that large firms tend to hold more debt, because they are regarded as being 'too big to fail'. Hall et al. (2004) find a positive association between firm size and long-term debt ratio, but a negative relationship between size and short-term debt ratio.

Santi (2003) conducts the analysis of determinants of Indonesian firms' capital structure, finds that firms employ relatively high debt in their capital structure; around 53%, 15%, and 38% for total debt, long-term debt, and short term debt respectively suggesting that Indonesian firms faced the decreased in their equity values, and increase the debt values due to exchange rate swing. The results from pooled GLS model show that tangibility and size of the firm variables has a significant positive influence on all leverage measures, profitability variable have a significant negative relationship with all leverage measure except for long-term debt ratios.

Amidu (2007) shows that profitability, asset structure, size, growth and corporate tax have significant influence on banks' financing pattern and findings are consistent with corporate finance theories such as trade-off, agency cost and pecking order theories. Eldomiaty (2007) reports that long term debt shows a statistically significant positive relationship with total debt ratio, suggesting that company leverage changes positively according to the changes of long term debt.

Another study by Salawu and Agboola (2008) also carry out a study on the determinants of capital structure of large non-financial listed firms in Nigeria and find that profitability has a positive relationship with debt of large firms in Nigeria, and also that the large and profitable firms prefer debt because of the tax saving advantage. The results of the study also show that the large firms prefer short term debt to long-term debt financing and also that relationship between tangibility and long-term debt ratios was significantly positive and Size of the firm also shows a statistically significant and positive relationship with total debt and short-term debt.

Abor and Biekpe (2009) find that a significant positive relationship between asset structure (as measured by fixed asset divided by total asset) and long term debt and explain that the differences in institutional arrangements and financial markets between developed and developing countries justifies the need to look at the issue of capital structure decisions, its determinants as well as its impact on firm performance from the viewpoint of developing countries especially countries within sub-Saharan Africa.

Lingesiya (2012) identifies non-debt tax shield, profitability and tangibility as determinants of leverage in Sri Lankan companies. Sangeetha and Sivathaasan (2013) examine determinants of capital structure using a panel data set from 2002 to 2006 comprising 50 companies listed on Colombo Stock Exchange. Findings of the study reveal that the use of debt capital is relatively low in Sri Lanka and size, growth rate and profitability are statistically significant determinants of capital structure

Ajanthan (2013) conducts an analysis of determinants of the capital structure of 15 Sri Lankan hotels and restaurant companies from 2008 to 2012, finds that profitability is confirmed to be a relevant determinant for Sri Lankan hotels and restaurant companies. More profitable companies would tend to have fewer debts, since they use the retained earnings rather than debts.

Tse and Rodgers (2014) examine borrowing capacity as determinant of capital structure. Using a pooled regression analysis on data from manufacturing and non-manufacturing firms in China revealed that despite that capital structure is different across industries; borrowing capacity is a determinant of industries' capital structure.

Vijeyaratnam and Anandasayanan (2015) conduct the study relating to 'The Determinants of Leverage of Sri Lankan

Manufacturing Companies Listed on Colombo Stock Exchange' and using the firm level panel data for the period of 2008-2012. Sample of the study consists of thirty one manufacturing companies. The analysis shows that Profitability and Non debt tax shield are significantly associated with leverage of Sri Lankan manufacturing companies.

Ramadan (2015) points out that firms' size exerts a direct relationship on capital structure. Using a data set of 2000-2014 from the Jordanian industrial firms, his findings support to the trade-off theory. Ramadan (2015) notes that large size firms prefer to finance firms using debts while small-sized firms will have to extend their financing to external equity.

Hossain and Hossain (2015) find that tangibility and liquidity have positive relationship with long term debt in Dhaka stock exchange. Using a panel data analysis of 74 manufacturing firms between period 2002-2011, the authors noted that both trade-off theory and pecking order theories are dominating theories in Bangladesh. Kramer (2015) finds positive relationship between corporate tax rate and debt to assets ratio using fixed effect estimation on European data.

Pratheepan and Banda (2016) reports that firm size, profitability and growth show a statistically significant impact on total debt using the fixed effect regression. It can be reported that firm specific factors play an important role in concerning the capital structure of the Sri Lankan Listed companies.

Hypotheses Development

The main purpose of this study is to identify the determinants of capital structure of Sri Lankan Manufacturing companies in the light of the Trade off theory, Pecking Order theory and Agency Cost theory. The dependent variable in the study is the degree of leverage of the company. The existing literature has different explanation for the level of debt capital. In the present study, total debt ratio (Total debt divided by Total assets) and long term debt ratio (Long term debt divided by Total assets) as a proxy for the capital structure has been used for manufacturing firms of Sri Lanka.

After reviewing the existing empirical literature on determinants capital structure, seven key independent variables have been identified as the most used to explain capital structure alternatives.

Profitability

Profitability means as earnings before interest and taxes divided by total assets. Profitability plays an important role in leverage decisions as profits lead to retained earnings and other reserves which are used as an alternative source of financing. The association between firm's profitability and capital structure may be defined by the pecking order theory propositioned by Myers and Majluf (1984). Titman and Wessels (1988), Harris and Raviv (1991), Rajan and Zingales (1995), Qiu and La (2010), Booth et al. (2001) and Noulas and Genimakis (2011) report a significant negative relationship between the Profitability and leverage ratio. While Jensen, Solberg and Zorn(1992) and Mallikarjunappa and Goveas (2007) find a positive relationship between leverage and Profitability.

Along with the empirical evidence many researchers find mixed relationship. Therefore, following hypothesis is formulated in order to find out the relationship of profitability with capital structure.

H1: Profitability has a significant impact on leverage ratio.

Tangibility

Tangible assets mean a combine of various fixed assets like plants, machinery, land, and vehicles. The presence of tangible assets affects the capital structure of a company and its value in the event of bankruptcy. As compared to intangible assets, tangible assets don't lose their value in the event of bankruptcy. Rajan and Zingales (1995), Chen (2004), Mukherjee and Mahakud (2012) and Chiang, Cheng and Lam (2010) report that positive relationship between a firm's leverage and the tangibility of its assets. At the same time Huang and Song (2002), Smith (2012) and Bayrakdaroglu, Ege and Yazici (2013) examine a negative association between tangibility and leverage.

Based on literature discussion, we therefore hypothesized as follows.

H2: Tangibility has a significant impact on leverage ratio.

Size

Firm size is one of the most commonly used determinants of the capital structure of a company. The size of a company affects the ability and reach of the company in obtaining easy and low-cost debt financing (Sayilgan, Karabacak and Kucukkocaoglu (2006). Wald (1999), Santi (2003), Bayrakdaroglu et al. (2013) and Forte, Barros, Nakamura

(2013) show a positive association between the firm size and leverage ratios. While the studies by Titman and Wessels (1988) and Ooi (1999) observe negative relationship between the firm size and leverage.

Empirical studies find mixed evidence. Therefore, following hypothesis is formulated to examine the impact of firm size on leverage.

H3: Size has a significant impact on leverage ratio.

Growth

There is a different view on the relationship between capital structure and growth of companies. The empirical evidence on the relationship between leverage and growth are also not comprehensible. Rajan and Zingales (1995), Chen et al. (1997) and Abbad and Zaluki (2012) found out a negative relationship between growth and leverage ratio. On the other hand Ameer (2013) found out a positive relationship between growth and leverage.

The following hypothesis used to test whether growth is one of the determinants of capital structure or not for this study.

H4: Growth has a significant impact on leverage ratio.

Liquidity

Liquidity in assets is an easiness of converting assets into cash without affecting its value. Deesomsak, Paudyal and Pescetto (2004) and Viviani (2008) report a negative relationship between Liquidity and leverage ratio.

H5: Liquidity has a significant impact on leverage ratio.

Taxation

Nowadays, almost all of the researchers believe that tax is important for the firm's capital structure. If the firm wants to obtain a better tax-shield gain, it should use more debt and the firm needs a higher effective marginal tax rate. Modigliani and Miller (1958) pointed out that the tax rate is directly influenced by the debt-to equity ratio of the firms. Brounen, De Jong and Koedijk (2005) found that tax advantages are positively related to leverage based on data from European firms.

Hence this study has tested the following hypothesis in relation to the determinants of capital structure of listed manufacturing companies in Colombo Stock Exchange.

H6: Taxation has a significant impact on leverage ratio.

Non-Debt Tax Shield

Tax shield is a saving on tax which increases with the increase in debt percentage in the capital structure. Non-Debt Tax Shield is the tax reduction due to depreciation, amortization, and long-term deferred expenses. Wald (1999), Viviani (2008) and Deesomsak et al. (2004) reported a significant negative relationship between leverage ratio and Non-Debt Tax Shield.

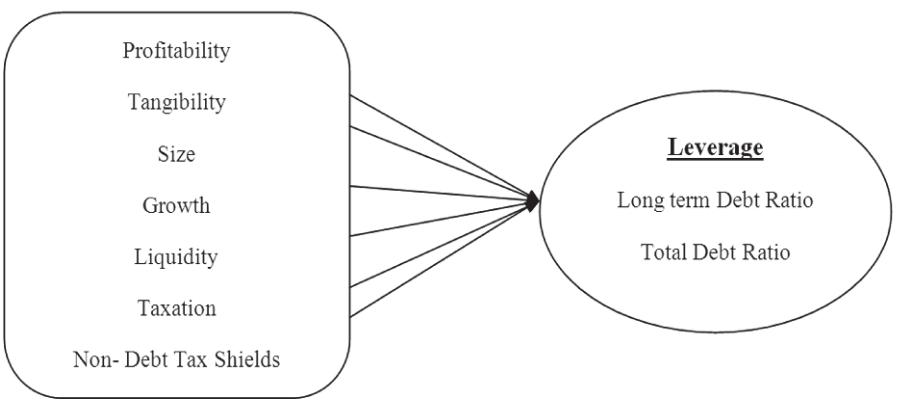
This study is conducted based on the following hypotheses to discover the relationship between Non debt tax shield and leverage

H7: Non–Debt Tax Shield has a significant impact on leverage ratio.

Conceptual Framework

Researchers develop a conceptual model after having a deep knowledge from the existing theories and researches. According to the review of literature, this study can present the association between independent variables and dependent variables as follows.

Figure 1: Conceptual Framework



Methodology

Data source

The present study used panel data for the analysis. The data utilized in this study is extracted from the comprehensive statements for income and financial position of the sample manufacturing companies quoted in Colombo Stock Exchange (CSE) database. The data have been collected over the sample period of 2012 to 2016.

Population and Sample

According to Jankowicz (2000; 192),sampling can be defined as the deliberate choice of a number of people, the sample, who are to provide with data from which the researcher will draw conclusion about some larger group and the population, whom these people represent. This study utilizes the listed manufacturing companies in Sri Lanka as its population. The sample of this study composed of randomly selected twenty manufacturing companies out of 41 listed in the Colombo Stock Exchange

Mode of analysis

The collected data was interpreted and simplified to make them eligible for the research purpose. In the present study, researchers analyzed the data by employing Descriptive and Inferential analyses. The analysis in this report relied heavily on excel models and statistical package Stata.

Model Estimation and Specification

Panel data analysis is more efficient as with this technique co linearity among the predictor variables is reduced and there is a gain in degrees of freedom. Panel data analysis helps to control for individual heterogeneity, unlike time-series or cross-sectional which helps to reduce bias in the results. Panel data analysis weakens the interaction between the variables as a resulting in more reliable parameters (Hsiao, 1999). The models for the panel data are more useful research tools, which give the researcher the capability to take into account any kind of effect that the cross-sectional data may have, and finally to estimate the suitable empirical model. An overall model for the panel data permits the researcher to empirically estimate the association between dependent and independent variables with more flexibility. (Eriotis, Vasiliou & Neokosmidi, 2007).

The fixed effects model considers the independence of each firms or cross-sectional unit incorporated in the sample by allowing the intercept vary for each company but still assumes that the slope coefficients are constant within the companies. The Fixed effects panel regression model assumes that the individual firm specific effects are correlated with the explanatory variables. The fixed effects exploit within - group variation over time by holding constant the average effects of each firm. Fixed effects model helps in reducing the omitted variable bias and controls for unobservable factors that are correlated with the variables included in the regression. The fixed effects model helps to control for individual heterogeneity which may be present among firms.

This study applied the fixed effects is given below:

$$LDRit = \beta 0 + \beta 1PFit + \beta 2TANit + \beta 3SZit + \beta 4GRit + \beta 5LQit + \beta 6Taxit + \beta 7NDTSit + \varepsilon it \quad \text{.....1)}$$

$$TDRit = \beta 0 + \beta 1PFit + \beta 2TANit + \beta 3SZit + \beta 4GRit + \beta 5LQit + \beta 6Taxit + \beta 7NDTSit + \varepsilon it \quad \text{.....2)}$$

Random Effect Models

In the random effect variations across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model.

$$LDRit = \beta 0 + \beta 1PFit + \beta 2TANit + \beta 3SZit + \beta 4GRit + \beta 5LQSit + \beta 6Taxit + \beta 7NDTSit + uit + \varepsilon it \text{...3)}$$

$$TDRit = \beta 0 + \beta 1PFit + \beta 2TANit + \beta 3SZit + \beta 4GRit + \beta 5LQSit + \beta 6Taxit + \beta 7NDTSit + uit + \varepsilon it \text{...4)}$$

Where:

TDRit	=	Total debt ratio of firm i at time t.
LDRit	=	Long term debt ratio i at time t.
Pfit	=	Profitability of firm i at time t.
TANit	=	Tangibility of firm i at time t.
SZit	=	Size of firm i at time t.
Grit	=	Growth of firm i at time t.
LQit	=	Liquidity of firm i at time t.
Taxit	=	Taxation of firm i at time t
NDTSit	=	Non–debt tax shields of firm i at time t.
$\beta 0$	=	Common - intercept.
$\beta 1$–$\beta 6$	=	Coefficients of the concerned explanatory variables.
εit	=	Stochastic error term of firm i at time t.
$\beta 0i$	=	y – intercept of firm i.
μit	=	error term of firm i at time t.
εi	=	cross–sectional error component
uit	=	error term of firm i at time t

Collected data were analysed using descriptive, correlation and regression analysis with the aid of STATA software. Descriptive analysis has been presented in table 1 below.

Table 1: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Profitability (PF)	100	-2.0584	.9832	.1815	.2810
Tangibility (TAN)	100	.5645	.9637	.8598	.0807
Size (SZ)	100	18.0643	23.1770	20.4042	1.1746
Growth (GR)	100	-.1507	1.0924	.1187	.1972
Liquidity (LQ)	100	.1862	9.2610	2.2222	1.9315
Taxation (Tax)	100	-.8818	.7098	.0909	.1687
Non Debt Tax Shield (NDTS)	100	.0087	.2978	.0485	.0498
Long term debt to total assets (LTD/TA)	100	.0032	1.1640	.1247	.1588
Total Debt to Total Assets (TD/TA)	100	.0371	1.2347	.2265	.2005

Source: Survey data

Descriptive statistics of the variables have been presented in table 1, mean value of profitability was 0.1815, maximum value was 0.9832 and minimum value was -2.0584. Average value of the tangibility was 0.8598, it had largest value of 0.9637 and the smallest value was 0.5645. Size had mean value of 20.4042 while it had maximum value of 23.1770 and minimum value of 18.0643. Further, it had standard deviation of 1.1746. Growth and liquidity had mean values 0.1187 and 2.2222 respectively. Likewise, taxation and non debt tax shield had mean values of 0.0909 and 0.0485 respectively. Mean value of long term debt to total assets ratio was 0.1247, minimum and maximum values were 0.0032 and 1.1640 respectively. Even though, total debt to total assets ratio had mean value of 0.2265 even it had the largest value of 1.2347.

Table 2: Correlation Analysis

Variables	PF	TAN	SZ	GR	LQ	TAX	NDTS
PF	1.000						
TAN	-0.0727	1.000					
	0.4720						
SZ	0.0929	-0.1052	1.000				
	0.3577	0.2976					
GR	-0.4172*	-0.1063	-0.0578	1.000			
	0.0000	0.2924	0.5678				
LQ	0.1935	-0.4290	0.1557	-0.0269	1.000		
	0.0537	0.0000	0.1219	0.7906			
TAX	0.2729*	0.1102	-0.0140	-0.0300	0.1868	1.000	
	0.0060	0.2752	0.8903	0.7668	0.0628		
NDTS	0.0047	0.0615	-0.3500*	-0.1156	-0.3262*	0.0273	1.000
	0.9630	0.5434	0.0004	0.2522	0.0009	0.7876	
LTD/TA	**-0.4070***	0.0574	**0.1848**	0.1340	**-0.3102***	**-0.3675***	-0.0358
	0.0000	0.5705	**0.0657**	0.1837	**0.0017**	**0.0002**	0.7235
TD/TA	**-0.5207***	0.0360	0.0952	**0.2011***	**-0.4699***	**-0.4045***	0.0061
	0.0000	0.7219	0.3460	**0.0448**	**0.0000**	**0.0000**	0.9518

Source: Survey data

As per the results presented in the table 2, there was a significant negative relationship of profitability (r = -0.4070, P < 0.01), liquidity ((r = -0.3102, P < 0.05) and taxation (r = -0.3675, p < 0.01) with long term debt to total assets ratio. However, there was a significant positive relationship between size and long term debt to total assets ratio (r = 0.1848, P < 0.1). Anyway, tangibility, growth and non debt to tax shield did not significantly associated with long term debt to total assets ratio. In a similar way profitability (r = -0.5207, P < 0.01), liquidity (r = -0.4699, P < 0.01) and taxation (r = -0.4045, P < 0.01) had significant negative relationship with total debt to total assets ratio. But growth had a significant positive relationship with (r = 0.2011, P < 0.05) total debt to total assets ratio. Tangibility, size and non debt tax shield did not show any significant relationship with total debt to total assets ratio.

A Variable Inflation Factor (VIF) test is conducted to examine whether multicollinearity exists amongst independent variables. Nachane (2006) suggested that VIF < 10.0 is an acceptable. Accordingly, to the table 3, the highest variance inflation factor (VIF) is 1.46. Therefore, there is a very low level of multicollinearity and as such multicollinearity does not seem to be an issue in this study.

Table 3: Test on Variable Inflation Factor

Variable	VIF	1/VIF
LQ	1.46	0.6836
PF	1.36	0.7357
NDTS	1.31	0.7628
GR	1.28	0.7821
TAN	1.28	0.7837
Size	1.17	0.8554
Tax	1.12	0.8912
Mean VIF	1.28	

Source: Survey data

Regression Analysis

In this section, researchers employed panel data estimation method to identify the factors determining the capital structure of listed manufacturing companies in Sri Lanka. The study so assumed that the different intercept for each company and for both fixed and Random effect regressions.

Table 4, presented the results of panel data multiple regression analysis using fixed and random models to examine the determinants of long term debt to total assets ratio. The F-statistics value for the fixed effect model was 2.74 ($p<0.01$) and random effect model was 37.80 ($p<0.01$) which showed that the independent variables were jointly statistically significant in the fixed and random estimates in explaining variations in long term debt to total assets ratio. The R-square statistics value of 0.226 and 0.1752 showed that the independent variables jointly account for about 23% and 18% of variation on long term debt to total assets ratio in the fixed and random effects models respectively. With the results of Hausman test statistics (175.75, $P < 0.01$), it was rejected the null hypothesis that differences in coefficient of the fixed and random estimates were systematic, thus we accept and interpret the fixed effect model.

From the results presented in the fixed effect model, there was a significant negative relationship of profitability ($\beta = -0.129$, $P < 0.1$), tangibility ($\beta = -0.519$, $P < 0.1$), liquidity ($\beta = -0.0247$, $P < 0.1$) and taxation ($\beta = -0.269$, $P < 0.0.1$) with long term debt to total assets ratio. Size was significantly and positively related ($\beta = 0.105$, $P < 0.05$) to long term debt to total assets ratio. However, growth and non debt tax shield did not show any significant relationship with long term debt to total assets ratio in fixed effect model. Therefore, as per the fixed effect model presented in the table 4, H1 was supported with the results of the study that there was a significant negative effect of profitability on long term debt to total assets ratio. H2 was also supported with the results of the study that there was a significant negative effect of tangibility on long term debt to total assets ratio. H3 was supported with the results of the study that there was a significant positive influence of size on long term debt to total assets ratio. H4 and H7 were not supported with the results of the study that there was no significant effect of growth and non debt tax shield with long term debt to total assets ratio. However, H5 H6 were supported with the results of the study that there was a significant negative effect of liquidity and taxation on long term debt to total assets ratio.

Table 4: Multiple regression analysis

	Fixed Effect Model	Random Effect Model
VARIABLES	LTD/TA	LTD/TA
PF	-0.129*	-0.143***
	(0.0691)	(0.0550)
TAN	-0.519*	-0.262
	(0.278)	(0.202)
SZ	0.105**	0.0347**
	(0.0510)	(0.0145)
GR	0.0229	-0.00493
	(0.0717)	(0.0726)
LQ	-0.0247*	-0.0240***
	(0.0133)	(0.00916)
TAX	-0.269***	-0.238***
	(0.0831)	(0.0816)
NDTS	-0.426	-0.0665
	(0.546)	(0.336)
Constant	-1.457	-0.253
	(1.045)	(0.370)
Observations	100	100
R-squared	0.226	0.1752
F-statistic(p-value)	2.74(0.001)	37.80(0.000)
Hausman Specification Test Prob> Chi2	175.75(0.000)	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Regression Analysis to investigate the factors determining the capital structure (Total Debt to Total Assets ratio) of manufacturing companies

Table 5: Multiple regression analysis

	Fixed Effect Model	Random Effect Model
VARIABLES	TD/TA	TD/TA
PF	-0.256***	-0.229***
	(0.0683)	(0.0566)
TAN	-0.833***	-0.651***
	(0.275)	(0.220)
SZ	0.126**	0.0356**
	(0.0504)	(0.0170)
GR	0.0344	0.00698
	(0.0709)	(0.0727)
LQ	-0.0446***	-0.0480***
	(0.0131)	(0.0100)
TAX	-0.279***	-0.278***
	(0.0822)	(0.0828)
NDTS	-0.323	-0.104
	(0.539)	(0.368)
Constant	-1.448	0.236
	(1.033)	(0.422)
Observations	100	100
R-squared	0.388	0.3453
F-statistic(p-value)	6.61 (0.000)	75.11(0.000)
Hausman Specification Test Prob> Chi2	156.12(0.000)	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5 presents the results of panel data multiple regression analysis using fixed and random models to examine the factors that are determining the total debt to total assets ratio. The F-statistics value for the fixed effect model was 6.61 ($p<0.01$) and random effect model was 75.11 ($p<0.01$) which have shown that the independent variables were jointly statistically significant in the fixed and random estimates in explaining variations in total debt to total assets ratio. The R-square statistics value of 0.388 and 0.3453 showed that the independent variables jointly account for about 38%, and 34% variation in total debt to total assets ratio in the fixed and random effects models respectively. Performing by the Hausman test statistics of (156.12, $P < 0.01$), it was rejected the null hypothesis that differences in coefficient of the fixed and random estimates were systematic, thus we accept and interpret the fixed effect model.

From the results presented in the fixed effect model in table 5, there was a significant negative relationship of profitability ($\beta = -0.256$, $P < 0.01$), tangibility ($\beta = -0.833$, $P < 0.01$), liquidity ($\beta = -0.0446$, $P < 0.01$) and taxation ($\beta = -0.279$, $P < 0.01$) with total debt to total assets ratio. Size was significantly and positively related ($\beta = 0.126$, $P < 0.05$) to total debt to total assets ratio. However, growth ($\beta = 0.0344$, $P > 0.05$) and non debt tax shield ($\beta = -0.323$, $P > 0.05$) did not show any significant relationship with total debt to total assets ratio. Therefore, as per the fixed effect model , H1, H2, H5 & H6 were supported with the results of the study that there was a significant negative effect of profitability, tangibility, liquidity and taxation on total debt to total assets ratio. Even though, H2 was also supported with the results of the study that there was a significant positive effect of size on total debt to total assets ratio. However, H4 & H7 were not supported with the results of the study that there was no significant effect of growth and non debt tax shield on total debt to total assets ratio.

Conclusion

This study has empirically examined the determinants of capital structure of listed manufacturing companies in Sri Lanka for the period from 2012 to 2016. Current study considered the profitability, tangibility, size, growth, liquidity, taxation and non debt tax shield as factors to determine the capital structure in terms of long term debt to total assets ratio and total debt to total assets ratio. Panel data have been collected from the annual reports of the respective banks. Fixed effect model and random effect models were performed to identify the factors determining the capital structure of listed manufacturing companies in Sri Lanka. Hausman specification test was used to evaluate the best model from random and fixed effect models. Fixed effect model was considered as best model to explain the results of the study. The results of the study revealed that profitability, tangibility, size , liquidity and taxation as determinants of capital structure in terms of long term debt to total assets ratio and total debt to total assets ratio. Anyhow, growth and non debt tax shield were not significantly influenced on

capital structure. According to the findings profitability, tangibility, liquidity and taxation are negatively associated with the leverage. These results are consistent with the study of Noulas and Genimakis (2011) conducted in Greek, Bayrakdaroglu et al. (2013) study conducted on Turkish capital market and Viviani (2008) study conducted based on French companies in the wine industry. The size is positively correlated to leverage of Sri Lankan companies, which is consistent with Forte et al. (2013) study conducted on Brazilian enterprises.

Along with the findings standard debt ratio of Sri Lankan companies is around 23%. Decision of debt level is influenced by the profitability, tangibility, size, liquidity and taxation variables. Throughout this study, it has been proved that pecking order theory is more pertinent in explaining the determinants of capital structure of the Sri Lankan companies. Consequently, it could be concluded that functioning of pecking order theory is more fitting to Sri Lankan companies. On the other hand, trade-off theory and agency cost theory cannot be abandoned because of the right forecast of the positive signal of size and negative forecast of tangibility. This study has major policy implications for the finance managers of the Sri Lankan Companies. The finance managers should consider these determinants in capital structure related decision. Previous studies have provided diverse conclusions on the determinants of capital structure. As such, this study contributes to the ongoing discussion about the determinants of capital structure by bringing fresh evidence from current data in Sri Lankan Manufacturing companies. The findings of this study contribute towards a better understanding of financing behaviour in manufacturing companies. Anyway, this study suggests to direction for the future studies with large sample size considering different sectors.

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Meta-analysis of Leadership Styles and Follower's Performance

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Abstract

The Paper attempts to do meta-analytic research of coefficient correlation effect among employees/followers' performance and their leadership style. This descriptive paper embraces fresh and latest papers published between 2010 and 2018. Altogether, 108 studies were thoroughly analysed; the inferences are based on 20 studies providing the best evidence, based on autonomous samples of over 56 key effect sizes , only 43 positive effects were included. This research has tested both the fixed-effects model (with the point estimate value of .0489) and random-effects (value of .0421) respectively to present correlation coefficient which is 0.036 that is the minimum effect with 115 sample size and 0.925 which is the maximum effect with 194 sample size. To identify the statistical significance among the measured moderator variables, only the sampling region was used. This study is general in nature as it includes all the leadership styles without specification.

Keywords: *Meta- analysis, leadership style, employee's performance, fixed effect model, random effect model.*

The purpose of this meta-analysis was to synthesize quantitative research studies of leadership styles and employees' performance available from September, 2010 till 2018 in direction to examine the coefficient co-relation amongst these two variables as it is important to discover and quantify the degree to which variables in the dataset are dependent upon each other. The drivers of the strategic factors in an organization mostly depends on the leader's leading styles, where they are likely to motivate subordinates in achieving executive goals through lifting the employee's (followers) performance. Shafie et al, 2013 "explains the relevance of leadership styles exclusively on humanoids, as they are apparently the prime strength of every company." Generally, it is the employee who nurtures the life of the organizations with their leaders/superiors to survive in this critical market. It is imperative to provide workforce the proper path and emotional fulfilment to get the finest from them, which comes from a good leader. Leadership style is possibly the utmost explored organisational factor that has a probable effect on employee performance. The globalization has transformed the ecosphere into a small global township; a community in which there is an unending brook of disputations and competitions among organizations. So, here leadership is critical for companies in realizing their conventional purposes, which needs to be understood suitably.

Different leading styles carry different significance or unintended impact on the employee's attitude or view points and it is evident in literature that no single style can impact employees positively across all sectors. All leadership style are successful in their account of relationships with their followers, but not necessarily a single leadership style can always have a positive impact on employee performance as the same style can affect negatively in another case, depending on the nature of followers, organization culture and the situation. Subsequently, corporations endeavour to quest prodigious leaders that can lead them to favourable results. Numerous attentions have been raised by scholars to detect how great leaders trigger the organization and the resources. The success of any company depends on supervisor/leader's style to optimise the foremost organizational resources that is human capital and further to realize the status of workforces in attaining the goals. Plentiful pragmatic evidences have verified that leader's behaviour influence their followers' performance and it will deteriorate, if neglected in direct proportion. Thus, the researcher's intention is to confer whether different styles of leadership ensures & stimulates the followers/employees performance or not. This meta-analysis will conclude the overall effect and magnitude between both the elements (leadership styles and employee performance), without any categorization. The paper will determine the strength of the significant variables that are being surveyed, and offer a quantitative evaluation of leadership-style efficacy for employee's/followers job performance.

Leadership styles: leaders promote several styles towards the direction of persuading the personnel; through this they can better envisage the success of the organization. The variables on the basis of which the current analysis was conducted were autocratic style which believes in giving directions without explication and expects the subordinates to follow them blindly; such style can be effective at the time of crisis of an expert in team or emergency situation. In consultative style, a leader builds trust and consults the team associates to give their fair suggestions and ideas, by holding the ultimate say. Participative styles has been used to develop ideas as the leader uses group decision making tools and ensures that each follower's voice is heard equally before making any decision as this style focuses on group problem-solving and brainstorming. Charismatic style emphasizes on reorganizing and dedicating towards the exceptional transparency, and character of an individual person. Authentic leaders walks the talk and practise what they preach like corporate leaders. It is the capability to lead from front with morals and ideologies and equality, faith and transparency. Democratic leaders believe in team work and ask followers for their suggestions, and make them believe that, they form part of decision making process (Lewin, Lippitt, and White,1938). This style of leadership works especially, when organization has ample time for decision making and the issues requires an expert opinion. In transactional leadership style, the leader sets clear goals & objectives for followers and use reward/ recognition & punishments as a measure to encourage compliance with company policy (Bass, 1990). Laissez-faire, on the other hand is a free-run style, where followers get freedom to do perform their jobs, specifically when working with highly skilled, motivated, and intelligent team. Here, the leader delegates the right tasks to the right person. Transformational leadership is an emerging term used for leaders who work to fulfil the expectations and desires of groups into a vision, by inspiring them while permitting them to chase those dreams. Bureaucratic leaders follow instructions meticulously, and confirm that followers also do the same. These various blend of styles may assist to form quantitative analysis. The most effective leadership style was determined by correlating with the followers performance.

Employee Performance: Performance is viewed as an outcome and exposition of duty in accord with the position within the company. (Hakala, 2018) stated that performance dimension is continuous signal for all officials and their subordinates including key indicators like cost-effectiveness , quantity, timeliness, quality, edification and training, job experience, and career progress. (Tandoh, 2011) also specified that, the performance of the worker speaks for the existence and victory of the firm. Employee performance included executing defined duties, extra efforts, satisfaction, dependability, effectiveness, meeting targets, team inputs, and attaining departmental goals. It has evolved as a global matter in recent corporate world to an extent that administrators have established an exceptional attempt to measure & control it. (Armstrong & baron, 1998; Hernandez et al, 2011; Mahdi et al, 2014; Asrar-ul-Haq & Kuchinke, 2016; Yang and LIM, 2016) suggested that employee performance also has to include dimensions like performance improvement, career development, interactive skills, punctuality and productivity. After reviewing the literature, it shows that there are various indicators to measure job performance of employees, and the above mentioned dimensions are widely notified factors to gauge employees' performance.

Meta-analysis collects the quantifiable decisions from distinct but alike papers and proposes the total effect of relation in the arithmetical/ numerical form (Petrie et al, 2003). To sum up the impact, the results in the paper are concluded either as an extent of variables relationship or the state of "variance" among set "means". There are numerous metrics to measure/ quantify "effect" size like the "Pearson" product-moment "correlation- coefficient" as (r); odds ratios, risk rates, risk differences and the effect-size index, d;. (Law, Schmidt & Hunter, 1994). Among all the literature utmost applied research "effect" size was correlation coefficient and so is the focus of this particular study. Here, the elementary code estimates distinct research / studied "effect" sizes alter them to a definite metrics & after then syndicate it to gain an average "effect" size. Here, the studies are classically weighted in the precision of the impact size delivered i.e. "sampling precision", sample size as a weight is a way to realize that size. Subsequently, the mean effect size get premeditated than it is stated in footings of "Z score"-standard normal deviations through dividing (/) with the "standard" error of "mean". For each study, collected meaningful results were traced and analysed in positive relationship. Similarly, the coded leadership styles and employee performance variables across the studies were sort. This will conclude that constructive effect size specify growths in influence, negative effect size shows deterioration in influence, and zero effect size symbolize firmness in impact. It's been noticed as "meta-analysis" is assumed by way of an attempting mode to "determine" the factual result/ effect "sizes" by combining effect sizes from individual studies. To conceptualise this process, it can be done with two ways fixed & random effects models. In our study we have examined both the effect size where, the concept of fixed effect assumes that the "Result/effect" size in the population are static, but then unidentified (constants) while random effect assumes that the results will vary in accordance.

Review of literature

The pragmatic meta-analytic measures the existing literature, testing various styles of leadership and followers performance, which further, elaborate the quantification of the variance in correlations among them. "This procedure of rational generalization was used with the 15 articles identified by R. D. Mann as inspecting the relationship between personality traits and leadership by merging with 9 consequent studies in an further set of meta-analyses." This was used to determine where moderator variables should play a serious part in future research. Along with this, numerous theoretical notes and proposals are presented. Meta-analysis of 45 researches on leadership styles, concluded that female leaders stood more transformational in comparison to male leaders.[1] Examines of 54 "experiential" studies of panel alignment comprising (159) "samples" along with n=(40,160) & 31 "practical" research studies of "panel leadership" construction of samples n=(12,915) & 69 & the associations with every firm/company "fiscal performance" was also conducted which relied upon the firm size.[2] Here, the paper was created on 117 autonomous samples over 113 prime studies, showed that transformational leadership was completely interrelated to the performance of individual followers across norms, with a solider link with contextual performance over task performance.[3] Conclusions of the connection among four traits i.e. self-esteem,

1* A meta-analysis comparing women and men. By Eagly, Alice H.,Johannesen-Schmidt, Mary C.,van Engen, Marloes L. Psychological Bulletin, Vol 129(4), Jul 2003, 569-591.

2* © 1998 John Wiley & Sons, Ltd. Dan R. Dalton , Catherine M. Daily , Alan E. Ellstrand , Jonathan L. Johnson 1998.

comprehensive self-efficacy, locus of control, and emotional constancy with work performance.[4] was also drawn. Study gave a complete investigation regarding the "full-range" of "transformational", "transactional", & "laissez-faire" leadership with the outcome depending on "626" correlations (effects) comprising of 87 bases exposed an global validity aimed to "transformational" style of (.44) and rationality widespread over longitudinal and multisource designs.[5] (Levasseur, 2004) made research blend on meta-analysis outcomes (DeGroot et al.'s, 2000), which highlighted the necessity of further examination on visionary and charismatic components of transformational leadership styles with the effect on their followers satisfaction & organizational performance. "Fiedler" & House in 1988 summarised "leadership" as the furthermost explored "variable" which gave a probable influence on organisation (Maritz, 1995; Ristow, et al, 1999) worker's performance. (Cummings & Schwab, 1973; Kirkpatrick & Locke, 1996) acknowledged almost 35 studies explanatory relationships in both the variables. (Armstrong, 2010) significantly prejudiced by leader's "style". (Walumbwa, 2011) said that leadership-styles has an imperative part to certify the organizations aspirations & individual performance. (Gul et al, 2012; Miller et.al, 2007) stated about ROI as not a return on "investment" but return on "individual", which figure out that leading style can only be calculated, how employees performed with the degree of efficiency & creativity. The association amongst leadership over performance has recognized significant attention (Gadot, 2006). It's appropriate for managers who practice it, however, it's not essential to follow the similar style. A leader can alter his style, few are rigid to change their style, but there are few who alter their leadership style successfully. All successful managers are aware about the relevance of leadership style, as they trust in optimum use of employee performance. This study has used a statistical system in which, evidence from different independent research papers, articles, thesis, dissertations are assimilated. The outcome of this paper is that the leadership style has direct impact on the followers' performance.

Fixed and random effects model was built for testing of homogeneity and heterogeneity, the fixed effects is presumed that entire study was derived from a collective population, and that the correlation coefficient was not suggestively diverse among the various studies. Here the supposition gets verified thru "Heterogeneity test," if "result" yields a low value "P" ($P<0.05$), FE model will not get acceptable, so random effects model become more appropriate, where the both random variation in the studies and amongst the dissimilar studies will be merged. (Hedges-Olkin, 1985).

Table 2.1:

Model	Effect size and 95% interval				Test of null hypothesis (2-Tail)	
	Number of Studies	Point estimate	Lower limit	Upper limit	Z-value	P-value
Fixed	43	0.489	0.471	0.508	43.234	0.000

Table 2.2: Test of Heterogeneity in fixed modal

Test for Heterogeneity			
Q-value	df (Q)	P-value	I-squared
1197.275895	42	0.000	96.492
Inference	**Heterogeneity is present hence random effect model is adopted**		

3* Transformational Leadership and Performance Across Criteria and Levels: A Meta-Analytic Review of 25 Years of Research ,Gang Wang, In-Sue Oh, Stephen H. Courtright

4* Relationship of core self-evaluations traits—self-esteem, generalized self-efficacy, locus of control, and emotional stability—with job satisfaction and job performance: A meta-analysis. By Judge, Timothy A.,Bono, Joyce E. Journal of Applied Psychology, Vol 86(1), Feb 2001, 80-92

5* Transformational and Transactional Leadership: A Meta-Analytic Test of Their Relative Validity. Judge, Timothy A.,Piccolo, Ronald F. Journal of Applied Psychology, Vol 89(5), Oct 2004, 755-768

Table: 2.3

Model	Study nam	Statistics for each study					Correlation and 95% C	
		Correlatio	Upper limi	Lower limi	Z-Value	p-Value		
	1_1	0.262	0.405246	0.106198	3.252414	1.14E-03		
	1_6	0.513	0.622115	0.384336	6.871997	6.33E-12		
	1_7	0.359	0.491012	0.210871	4.555575	5.22E-06		
	2	0.827	0.856499	0.792116	22.76196	0		
	2_1	0.801	0.834531	0.761558	21.27149	0		
	3_1	0.783	0.824747	0.732765	17.43154	0		
	3_2	0.159	0.271763	4.19E-02	2.65444	7.94E-03		
	4_1	0.443	0.59244	0.264087	4.540342	5.62E-06		
	4_3	0.479	0.621316	0.30609	4.976565	6.47E-07		
	5	0.161	0.293192	2.28E-02	2.279577	2.26E-02		
	6_1	0.4	0.54049	0.237809	4.582464	4.60E-06		
	6_2	0.322	0.47389	0.151503	3.61143	3.05E-04		
	6_3	0.263	0.422332	0.087902	2.913234	3.58E-03		
	7_1	0.427	0.591247	0.228744	4.003331	6.25E-05		
	7_2	0.031	0.249021	-0.19001	0.272111	0.785537		
	7_4	0.046	0.263058	-0.17549	0.403933	0.686262		
	8_1	0.581	0.697787	0.434124	6.539356	6.18E-11		
	8_2	0.241	0.417648	4.68E-02	2.421199	1.55E-02		
	9_1	0.173	0.501982	-0.19972	0.908067	0.363843		
	9_2	0.094	0.439389	-0.2756	0.489885	0.624216		
	10_1	0.8	0.845059	0.743658	15.38057	0		
	10_2	0.749	0.804299	0.680839	13.58943	0		
	10_3	0.82	0.860901	0.768568	16.19544	0		
	11	0.762	0.829386	0.67276	10.59324	0		
	11_1	0.28	0.440524	0.102126	3.044541	2.33E-03		
	11_2	0.166	0.338812	-1.76E-02	1.773188	7.62E-02		
	11_3	0.059	0.239523	-0.12547	0.625123	0.53189		
	11_4	0.036	0.217676	-0.14809	0.381153	0.70309		
	11_5	0.288	0.447511	0.110729	3.136633	1.71E-03		
	12_1	0.283	0.393473	0.16447	4.56322	5.04E-06		
	12_2	0.315	0.422761	0.198455	5.114468	3.15E-07		
	12_3	0.269	0.380589	0.149689	4.325527	1.52E-05		
	13_1	0.7	0.783098	0.592344	9.137578	0		
	13_2	0.15	0.32495	-3.49E-02	1.592363	0.111303		
	14_1	0.215	0.385189	3.07E-02	2.280245	2.26E-02		
	14_2	0.243	0.410066	6.02E-02	2.588778	9.63E-03		
	14_3	0.154	0.330122	-3.25E-02	1.620701	0.105082		
	15	0.25	0.359463	0.13375	4.1421	3.44E-05		
	16	0.925	0.942994	0.901614	22.42473	0		
	18_1	0.221	0.355764	7.72E-02	2.989535	2.79E-03		
	18_3	0.048	0.192909	-0.09896	0.63909	0.522765		
	19_1	0.374	0.50405	0.227366	4.765667	1.88E-06		
	20	0.357	0.536879	0.146074	3.234115	1.22E-03		
Fixed		0.489486	0.507721	0.470812	43.23368	0		

For clearer picture we can refer to Forest plot of fixed effect model in appendix.

Figure: 1.1

Since the fixed effect weighted mean of correlation cannot be considered as good fit for the data and so, for testing the goodness of fit for Meta- analysis. The "random" effects model inclined to bring a added conventional estimate, the outcomes from both models typically approve at time of "No heterogeneity" and when "heterogeneity" is existing the "random"- "effects" model should be considered as an ideal model.(mentioned in table 2.3).

Table 3.1: Random effect Model:

Meta-analysis						
Model	Effect size and 95% interval				Test of null hypothesis (2-Tail)	
	Number of Studies	Point estimate	Lower limit	Upper limit	Z-value	P-value
Random effects	43	0.421	0.308	0.522	6.731	0.000

Table 3.2 : Test for Heterogeneity:

Test for Heterogeneity - Random effect			
Q-value	df (Q)	P-value	I-squared
33.366	42	NS	0.000
Inference	Heterogeneity is not present		

"Random-effects model" was considered more suitable & superior than to "fixed-effects models" for meta-analysis, REM display lesser "Type I error" in "significance tests" for mean effect estimates and relations, further for mean effect estimates they don't overrate confidence intervals. In the meta-examination, the population "effect" sizes differ randomly from study to study. It was found that all similar studies extracted from a population was expected to get the "effect" size mixed from other researched studies. As, the studies involved in the fixed effect model could not be functionally comparable, therefore we used "random-effects" model and the overall "effect" of leadership styles on followers performance was found with point estimation 0.42. The Cochran's Q was calculated as 33.365 ($p > 0.05$) which is statistically insignificant. The "I2" was calculated as 0.00% which shows insignificant heterogeneity among the studies chosen for research. This signifying 0% of the variability in leading styles "effect" estimates as 100% due to chance.

Hence the random effect weighted mean of correlation (0.421) can be considered as estimated mean correlation for the study. The researcher accounted for changeability in heterogeneous effect sizes by linking them to the attributes of the studies when homogeneity is absent. As projected, the fixed- effect investigation spotted that heterogeneity of (43) effects is significant ($Q = 1197.275895$, $df = 42$, $p < 0.000$), with an I^2 of 96.492., which confirmed further examination by applying the "random-effect model". In the above table as shown, the coded studies account 42 independent effect sizes amid leadership styles and employee performance, based on a total sample of 6521. This inclusive analysis shows styles of leadership is strongly and positively related to performance.

Table: 3.3

Model	Study nam	Statistics for each study					Correlatio
		Correlatio	Upper limi	Lower limi	Z-Value	p-Value	
	1_1	0.262	0.405246	0.106198	3.252414	1.14E-03	
	1_6	0.513	0.622115	0.384336	6.871997	6.33E-12	
	1_7	0.359	0.491012	0.210871	4.555575	5.22E-06	
	2	0.827	0.856499	0.792116	22.76196	0	
	2_1	0.801	0.834531	0.761558	21.27149	0	
	3_1	0.783	0.824747	0.732765	17.43154	0	
	3_2	0.159	0.271763	4.19E-02	2.65444	7.94E-03	
	4_1	0.443	0.59244	0.264087	4.540342	5.62E-06	
	4_3	0.479	0.621316	0.30609	4.976565	6.47E-07	
	5	0.161	0.293192	2.28E-02	2.279577	2.26E-02	
	6_1	0.4	0.54049	0.237809	4.582464	4.60E-06	
	6_2	0.322	0.47389	0.151503	3.61143	3.05E-04	
	6_3	0.263	0.422332	0.087902	2.913234	3.58E-03	
	7_1	0.427	0.591247	0.228744	4.003331	6.25E-05	
	7_2	0.031	0.249021	-0.19001	0.272111	0.785537	
	7_4	0.046	0.263058	-0.17549	0.403933	0.686262	
	8_1	0.581	0.697787	0.434124	6.539356	6.18E-11	
	8_2	0.241	0.417648	4.68E-02	2.421199	1.55E-02	
	9_1	0.173	0.501982	-0.19972	0.908067	0.363843	
	9_2	0.094	0.439389	-0.2756	0.489885	0.624216	
	10_1	0.8	0.845059	0.743658	15.38057	0	
	10_2	0.749	0.804299	0.680839	13.58943	0	
	10_3	0.82	0.860901	0.768568	16.19544	0	
	11	0.762	0.829386	0.67276	10.59324	0	
	11_1	0.28	0.440524	0.102126	3.044541	2.33E-03	
	11_2	0.166	0.338812	-1.76E-02	1.773188	7.62E-02	
	11_3	0.059	0.239523	-0.12547	0.625123	0.53189	
	11_4	0.036	0.217676	-0.14809	0.381153	0.70309	
	11_5	0.288	0.447511	0.110729	3.136633	1.71E-03	
	12_1	0.283	0.393473	0.16447	4.56322	5.04E-06	
	12_2	0.315	0.422761	0.198455	5.114468	3.15E-07	
	12_3	0.269	0.380589	0.149689	4.325527	1.52E-05	
	13_1	0.7	0.783098	0.592344	9.137578	0	
	13_2	0.15	0.32495	-3.49E-02	1.592363	0.111303	
	14_1	0.215	0.385189	3.07E-02	2.280245	2.26E-02	
	14_2	0.243	0.410066	6.02E-02	2.588778	9.63E-03	
	14_3	0.154	0.330122	-3.25E-02	1.620701	0.105082	
	15	0.25	0.359463	0.13375	4.1421	3.44E-05	
	16	0.925	0.942994	0.901614	22.42473	0	
	18_1	0.221	0.355764	7.72E-02	2.989535	2.79E-03	
	18_3	0.048	0.192909	-0.09896	0.63909	0.522765	
	19_1	0.374	0.50405	0.227366	4.765667	1.88E-06	
	20	0.357	0.536879	0.146074	3.234115	1.22E-03	
Random		0.42106	0.522459	0.307918	6.730996	1.69E-11	

For more clear picture we can refer to Forest plot of Random effect modal in appendix. Figure:3.4

Discussion

Here, the degree of impact of leadership styles on employee performance was examined. The results displayed that, it had a considerable positive impact on employees work achievements, which approves several past researches that the leaders' style is a decisive issue in followers' job performance. Further, the correlation of different leadership styles analyzed, shows that all have a substantial effect on performance (i.e., consultative, laissez faire, servant, democratic, paternalistic, servant, autocratic, and transformational and transactional leadership styles).

The findings extend the results by highlighting clear understanding of the "effect", which is rather motivating as universally acceptable. Although, what is the real termed of "impactful leadership", and what can be the key variables denotes for leadership style is still blurred. This possibly can be attributed to some reasons like the cultural changes, varying employees' attitudes, changing followers' prospects in regard to their leaders. Further notably, situations frame a dynamic role in shaping or influencing the triumph of employees. The superiority of a leader might be effective for an employee in one situation among a specific team, but may not be same with another state or with another team member. Certainly, few of the other variables (e.g., indifference to organizational rewards, formalization, inflexibility, rewards outside the leader's control) that have some of the strongest relationships with the subordinate criterion performance, variables have been practically unheeded outside the substitutes of leadership.

These study meta-analytic tests presented that the maximum correlation was between transformational leadership style and employee performance. Unexpectedly, the least correlation was detected among transactional leadership style and performance. Thus, a priority for future research should be the development of a more detailed and justified explanation of different variables which influence the subordinate performance level. The results discovered that charismatic, autocratic, bureaucratic, supportive, laissez-faire, transformational and transactional styles have both positive and negative impacts on the employee performance level but statistically it is more positively significant. A total of 43 effect sizes from 17 journal publications (articles & research papers), 3 dissertations or thesis, were examined in this meta-analysis. Routing a meta-analysis means approaching with several decisions that permit a simplification for synthesising studies. Efforts occasioned in a sample that gave a sufficient volume of judgement and variety for meta-analyses, as shown by the coding phase. This paper with a sample of 20 "quantitative studies" along with 43 "effect" sizes was satisfactory for the evaluation conducted. Nevertheless, the effect sizes for explicit styles were too limited to divide into subgroups & small in the moderator analyses, besides, the measurements which were used in the basic studies varied.

Conclusion and Limitations

Leadership style is necessary in fostering employee performance. The findings contribute towards understanding the observed results. Thus, any proportional rise in respectable leaders style, leads to the higher employee performance. This calls for dynamic leadership style which has noteworthy effect on the human resources management as a whole. The organizations, who are involved to stay in an uncertain corporate environment, will be highly forced to take up the exact leadership style with excessive proficiencies and knowledge, along with persuasive effects which must be established at every strata of the company. But, on the other hand it is possibly right that leader, even an extremely collaborative one, practices a series of diverse styles at different periods, even in the path of a single day for different purposes. The constructive effect is essential, where authorities/organizations are subjected to get remarkable skilled and professional leaders to lead their subordinates with the blend of leader styles for attaining the strategic goals. "Random effect model" strengthen the degree of correctness. Moreover it also allows academics to make overview about the study sphere as a "whole" without limiting the conclusions and considered more realistic then Fixed model.

Limitations: This contemporary paper was relied on selected organizations and most applied leadership styles. However, for more clearer and global picture future study can be conducted with new and latest styles. Researchers can also concentrate on any specific leadership styles like transformation and transactional for any precise upshots. This study was limited in number of papers as only 43 effect sizes could be generated out of 20 studies. Greater sphere of this research would highlight the numerous scopes studied & hence, supplementary studies ought to contain a larger sample size. In regard to the employees' performance, negative leadership slants may seldom offer better descriptions than the positive leadership ones, so research can include negative effect sizes for more elaborative evidences in future.

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Appendices:

Table 1: Summary Of Table Shows Coefficient - Correlation Between Leadership Styles And Employee Performance

SN	CODE OF STUDY	NAME OF STUDY	YEAR OF PUBLICATION	EFFECT SIZE_ R	SAMPLE SIZE	PUBLICATIONS	AUTHOR	COUNTRY
1	1_1	The Influence Of Leadership Styles On Employee's Performance (democratic leadership style)	2017	0.262	150	Vadyba , Journal of Management	Liridon Veliu1, Mimoza Manxhari2, Visar Demiri3, Liridon Jahaj4	Kosovo, Europe
2	1_6	The Influence Of Leadership Styles On Employee's Performance (autocratic leadership style)	2017	0.513	150	Vadyba , Journal of Management	Liridon Veliu1, Mimoza Manxhari2, Visar Demiri3, Liridon Jahaj4	Kosovo, Europe
3	1_7	The Influence Of Leadership Styles On Employee's Performance (transformational leadership style)	2017	0.359	150	Vadyba , Journal of Management	Liridon Veliu1, Mimoza Manxhari2, Visar Demiri3, Liridon Jahaj4	Kosovo, Europe
4	2	Principals' leadership styles and teachers' job performance:	2018	0.827	376	Educational Management Administration & Leadership	OS Imhangbe, RE Okecha and J Obozuwa	Nigeria
5	2_1	Principals' leadership styles and teachers' job performance:	2018	0.801	376	Educational Management Administration & Leadership	OS Imhangbe, RE Okecha and J Obozuwa	Nigeria

6	3_1	The Relationship Between Leadership Style AndEmployee Performance(Case Study Of Real Estate Registration Organization Of Tehran Province)	2013	0.783	277	Singaporean journal of business economics, and management studies	Shafie, Bizhan And Baghersalimi, Saeid And Barghi, Vahid	Tehra, Iran
7	3_2	The Relationship Between Leadership Style AndEmployee Performance(Case Study Of Real Estate Registration Organization Of Tehran Province)	2013	0.159	277	Singaporean journal of business economics, and management studies	Shafie, Bizhan And Baghersalimi, Saeid And Barghi, Vahid	Tehra, Iran
8	4_1	Effect Of Leadership Styles On Employee Performance In Kampala District Council (corporate leadership style)	2010	0.443	94	Research Dissertation	Kawooya Nuhu	Kampala, Uganda
9	4_3	Effect Of Leadership Styles On Employee Performance In Kampala District Council (Laissez-faire style)	2010	0.479	94	Research Dissertation	Kawooya Nuhu	Kampala, Uganda
10	5	The Relationship Between Leadership Styles And Employees' Performance In Organizations (A Study Of Selected BusinessOrganizations In Federal Capital Territory, Abujanigeria	2014	0.161	200	European Journal of Business and Management	Mohammed, Umaru Danladi and Yusuf, MuniratOlafemi and Sanni, Isyaka Mohammed and Ifeyinwa, Theresa Ndule and Bature, Nana Usman and Kazeem, Aina Olalekan	Abuja Nigeria
11	6_1	Leadership Styles of Managers and Employee's Job Performance in a Banking Sector. (Transformational style)	2015	0.4	120	IOSR Journal Of Humanities And Social Science	1Olorundare AgbanaAisha t, 2Abu DaudSilong, 3Turiman Suandi, and 4Oladipo KolapoSakiru	Malaysia

12	6_2	Leadership Styles Of Managers And Employee's Job Performance In A Banking Sector. (Transactional style)	2015	0.322	120	IOSR Journal Of Humanities And Social Science	1Olorundare AgbanaAisha t, 2Abu DaudSilong, 3Turiman Suandi, and 4Oladipo KolapoSakiru	Malaysia
13	6_3	Leadership Styles Of Managers And Employee's Job Performance In A Banking Sector. (Laissez-faire style	2015	0.263	120	IOSR Journal Of Humanities And Social Science	1Olorundare AgbanaAisha t, 2Abu DaudSilong, 3Turiman Suandi, and 4Oladipo KolapoSakiru	Malaysia
14	7_1	Effects of leadership styles on employee performance at boa kenya limited (Transformational leadership)	2015	0.427	80	Research Dissertation Of The Open University Of Tanzania	Anyango, Celestine Awino	Kenya
15	7_2	Effects of leadership styles on employee performance at boa kenya limited (Transactional Leadership)	2015	0.031	80	Research Dissertation Of The Open University Of Tanzania	Anyango, Celestine Awino	Kenya
16	7_4	Effects of leadership styles on employee performance at boa kenya limited (Laissez Faire Leadership)	2015	0.046	80	Research Dissertation Of The Open University Of Tanzania	Anyango, Celestine Awino	Kenya
17	8_1	Impact of leadership style on employee performance (a case study on a private organization in malaysia) – (democratic)	2017	0.581	100	International Journal of Accounting & Business Management	Veronica Sebastian And Zubair Hassan	Malaysia

18	8_2	Impact of leadership style on employee performance (a case study on a private organization in malaysia(laissez faire)	2017	0.241	100	International Journal of Accounting & Business Management	Veronica Sebastian And Zubair Hassan	Malaysia
19	9_1	Examining leadership style on employee performance in the public sector of ghana (A case of ghana atomic energy commission) transformational style	2017	0.173	30	International Journal of Scientific and Research Publications	Ebenezer MalcalmPh.D And Stephen Tamatey	Ghana
20	9_2	Examining leadership style on employee performance in the public sector of ghana (A case of ghana atomic energy commission) transformational style	2017	0.094	30	International Journal of Scientific and Research Publications	Ebenezer MalcalmPh.D And Stephen Tamatey	Ghana
21	10_1	The Relationship between Effective Leadership and Employee Performance (Transformational)	2011	0.8	199	International Conference on Advancements in Information Technology	Wang, Hui and Law, Kenneth S and Hackett, Rick D and Wang, Duanxu and Chen, Zhen Xiong	Rajkot , India
22	10_2	The Relationship between Effective Leadership and Employee Performance (Transactional)	2011	0.749	199	International Conference on Advancements in Information Technology	Wang, Hui and Law, Kenneth S and Hackett, Rick D and Wang, Duanxu and Chen, Zhen Xiong	Rajkot , India
23	10_3	The Relationship between Effective Leadership and Employee Performance (Lassize faire)	2011	0.82	199	International Conference on Advancements in Information Technology	Wang, Hui and Law, Kenneth S and Hackett, Rick D and Wang, Duanxu and Chen, Zhen Xiong	Rajkot , India

24	11	The Influence Of Leadership On Employee Performance Among Jewellery Artisans In Malaysia	2017	0.762	115	International Journal of Accounting & Business Management	Lor, Wendy and Hassan, Zubair	Malaysia
25	11_1	The Influence Of Leadership On Employee Performance Among Jewellery Artisans In Malaysia (Supportive leadership)	2017	0.28	115	International Journal of Accounting & Business Management	Lor, Wendy and Hassan, Zubair	Malaysia
26	11_2	The Influence Of Leadership On Employee Performance Among Jewellery Artisans In Malaysia(Participative leadership)	2017	0.166	115	International Journal of Accounting & Business Management	Lor, Wendy and Hassan, Zubair	Malaysia
27	11_3	The Influence Of Leadership On Employee Performance Among Jewellery Artisans In Malaysia (Servant leadership)	2017	0.059	115	International Journal of Accounting & Business Management	Lor, Wendy and Hassan, Zubair	Malaysia
28	11_4	The Influence Of Leadership On Employee Performance Among Jewellery Artisans In Malaysia((Transactional leadership)	2017	0.036	115	International Journal of Accounting & Business Management	Lor, Wendy and Hassan, Zubair	Malaysia
29	11_5	The Influence Of Leadership On Employee Performance Among Jewellery Artisans In Malaysia (Transformational)	2017	0.288	115	International Journal of Accounting & Business Management	Lor, Wendy and Hassan, Zubair	Malaysia
30	12_1	The Influence of Leadership Styles on Employees Performance under Perceptions of Organizational Politics: A Study of Telecom Sector in Pakistan (Transformational Leadership)	2017	0.283	249	International Journal of Management Research and Emerging	Rathore, Kashif and Khaliq, Chaudhry Abdul and Aslam, Nauman	Pakistan
31	12_2	The Influence of Leadership Styles on Employees Performance under Perceptions of Organizational Politics: A Study of Telecom Sector in Pakistan (Transactional Leadership)	2017	0.315	249	International Journal of Management Research and Emerging	Rathore, Kashif and Khaliq, Chaudhry Abdul and Aslam, Nauman	Pakistan

32	12_3	The Influence of Leadership Styles on Employees Performance under Perceptions of Organizational Politics: A Study of Telecom Sector in Pakistan (, Perception of Politics)	2017	0.269	249	International Journal of Management Research and Emerging	Rathore, Kashif and Khaliq, Chaudhry Abdul and Aslam, Nauman	Pakistan
33	13_1	Leadership style and Performance of Small and medium size enterprises in Cameroon (transformational)	2016	0.7	114	Research Dessertations	Fokam Je Astein	Yaounnde
34	13_2	Leadership style and Performance of Small and medium size enterprises in Cameroon (Transactional)	2016	0.15	114	Research Dessertations	Fokam Je Astein	Yaounnde
35	14_1	Worker Productivity, Leadership Style Relationship (Autocratic)	2014	0.215	112	IOSR Journal of Business and Management	S. Anbazhagan, Bhargava R. Kotur2	India
36	14_2	Worker Productivity, Leadership Style Relationship (Democratic)	2014	0.243	112	IOSR Journal of Business and Management	S. Anbazhagan, Bhargava R. Kotur2	India
37	14_3	Worker Product ivity, Leadership Style Relationship (lassize faire)	2014	0.154	112	IOSR Journal of Business and Management	S. Anbazhagan, Bhargava R. Kotur2	India
38	15	Effect of Leadership Styles, Organizational Culture, and Employees Development on Performance (Studies in PT. PG. Gorontalo of Tolangohula Unit)	2015	0.25	266	International Journal of Business and Management Invention	Rahmisyari	Gorontalo, Indonesia
39	16	The Influence of Individualized Consideration Leadership Behaviour on Employee Performance in Small and Medium Enterprises in Kenya	2017	0.925	194	International Journal of Business and Social Science	Ogola, Mary Ganga Ogutu and Sikalieh, Damary and Linge, Teresia Kavoo	Kenya

40	18_1	The effects of leadership style on employees	2015	0.221	180	Thesis Submit	Engda, Jember Belete	Jimma, Ethiopia
41	18_3	The effects of leadership style on employees	2015	0.048	180	Thesis Submit	Engda, Jember Belete	Jimma, Ethiopia
42	19_1	Impacts of Leadership Style Effectiveness of Managers and Department Heads to Employees' Job Satisfaction and Performance on Selected Small-Scale Businesses in Cavite, Philippines	2016	0.374	150	International Journal of Recent Advances in Organizational Behaviour and Decision Sciences	Dr. Van S. Dalluayand Dr.Revenio C. Jalagat,	Philippines
43	20	The Effect of Leadership Style on Motivation to Improve the Employee Performance	2014	0.357	78	JurnalManajemenTransportasi&Logistik	Hanifah, Hanifah and Susanthi, Novi Indah and Setiawan, Agus	Indonesia

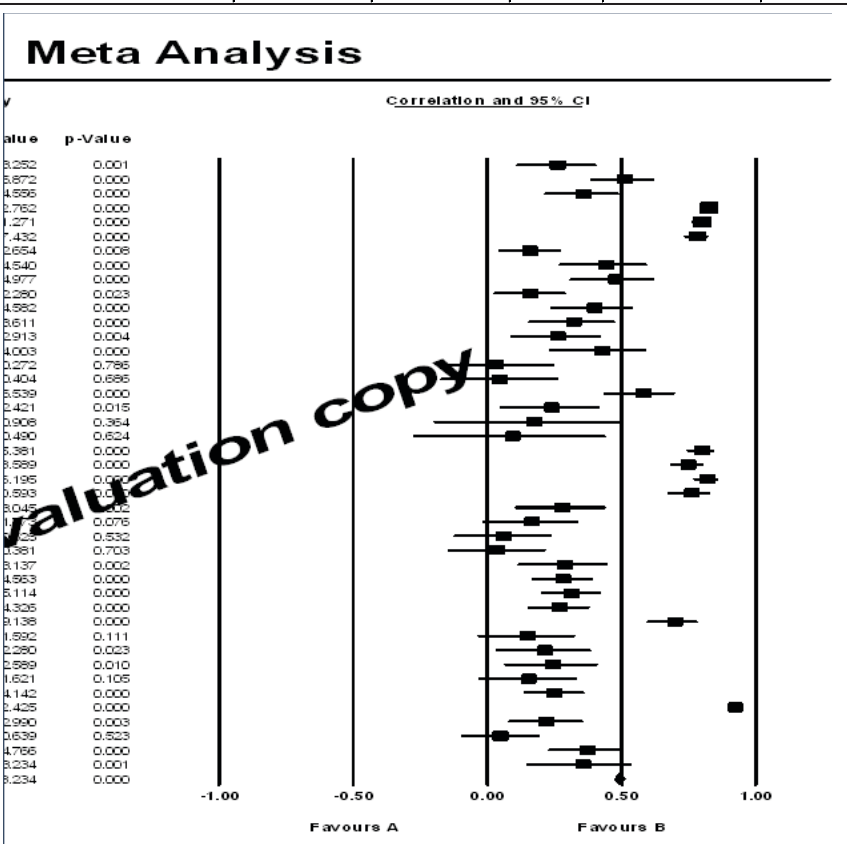

Figure 2.4: Graphical summaries: Forest plot of Fixed Effect:-

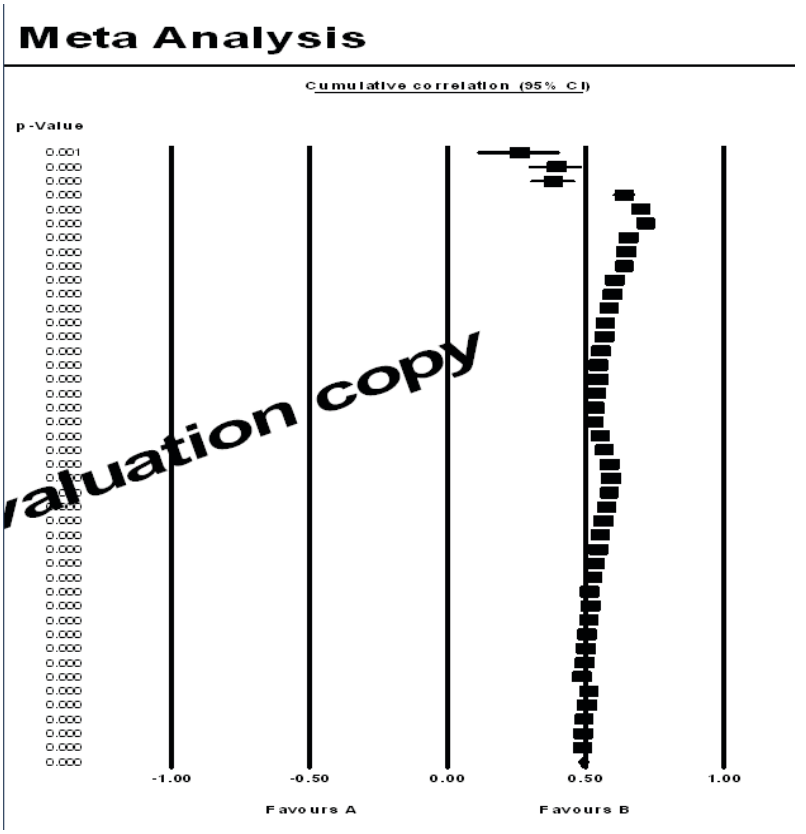

Figure 3:4 Graphical summaries: Forest plot of Random Effect:-

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Portable Solar Lanterns in Guwahati

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Abstract

This study is an attempt to explore the users' perception of portable solar lanterns in Guwahati city in Assam. This study has indicated that their manufacturers and sellers shall formulate a few marketing strategies in order to improve their sales and usage in the aforesaid city. Accordingly, it was observed that they should emphasize on potential and existing users of these lanterns who were self employed as professionals, or between 41 to 50 years in age, or with monthly income between Rs.30,001 to Rs.50,000. They should also focus on 18 parameters (of such lanterns) which include quality, design etc. Further, it was also noticed that among these 18 parameters, seven (7) parameters should be specifically emphasized on marketing strategies: quality, design, features, and packaging.

Keywords: Solar energy, portable solar lanterns, quality, design, features, packaging.

The sun is a huge reservoir of energy created by a chain of nuclear fusion reactions that goes on continually in it. It is found that the estimated temperature at the core of the sun is around 15,000,000ºC (Debenham 108-109; O'Connor, Steinkamp, Steinkamp and Siegelman 2353). In every second, around 4 million tons of hydrogen is being transformed into energy in the sun through these nuclear fusion reactions (Ridpath and Shakeshaft 22-23). Presently, there has been increased use of "solar powered photovoltaic (PV) cells" (a product of scientific advancement) which "convert sun's rays into electricity by exciting electrons in silicon cells using photons of light from the sun" (Ardley 49; NW Wind & Solar; O'Connor et al. 2256). In this regard, it seems worth to mention about the emphasis on solar electrification in rural areas in a study by Jacobson (144-146). Dubash (147-151) has highlighted the increasing importance of such solar PV technology in his study. This fact has also been emphasized by several organisation including Greenpeace, World Watch Institute etc. (Dunn 5-8, 16, 22-24, 27-29, 33-36, 44-49). The above mentioned solar PV cells may be used for lighting purposes as in the case of portable solar lanterns as far as electrification is concerned (Mapawatt; Ridpath and Shakeshaft 22-23). Portable solar lantern is a portable case having transparent or translucent sides for holding and protecting a light bulb powered by solar power through the use of solar photovoltaic (PV) cells (Reader's Digest Universal Dictionary 865, 1445; Webster Comprehensive Dictionary 717, 1194). These lanterns also include a rechargeable battery in the base and a solar panel connected to them in order to recharge the battery. The advent and subsequent use of Light-Emitting Diode (LED) bulbs in the above regard has further improved the productivity of such lanterns. The latter has proved to be a handy and cost effective product for lighting in case of all masses belonging to diverse sections of the society particularly in India (a fact noticed during the survey process involved in this study). In fact, it was observed that portable solar lanterns are characterised by various advantages. Few of the main advantages of such lanterns are:

i) Portability: A study by Bond, Aye, and Fuller (1081) has observed that portable solar lanterns are preferred by most users because of their portability. These can be easily carried to different places by users and hence, are particularly useful for people in rural areas including farmers. In addition, lighter weight of such lanterns also adds up to their advantages due to their portability.

ii) Lesser Risk: The earlier mentioned study by Bond et al. (1081) has also observed that another important advantage of portable solar lanterns is their lesser risk of damage compared to other lighting systems. This is particularly useful for low income and poverty stricken users. These views are also supported by Tong, Asare, Rwenyagila, Anye, Oyewole, Fashina, and Soboyejo (468).

iii) Safety: Portable solar lanterns are very safe for use as there are lesser chances of them catching fire or having any major accidents while using them. This was stated in the above study by Tong et al. (468).

iv) Convenience for use: Tong et al. (468) have highlighted the fact that portable solar lanterns are highly convenient for use. This characteristic is particularly advantageous for users belonging to all sections of the society.

v) Economical for use: Portable solar lanterns are highly economical for use (Tong et al. 468) as there are no additional costs associated with their charging process through the use of solar energy. As such, they may be highly beneficial for all types of users. In addition, such lanterns are optimally priced for such users as noticed during the survey process.

However, portable solar lanterns also have numerous disadvantages. It is found that life of its battery is reduced when it fully discharges (Greenhoe, Kramer, Jr. and Wolter 6). Also, there occurs degradation of the battery on full discharge resulting in lesser capacity to hold charge in each cycle. Further, when this battery becomes weak, the lights of such lanterns tend to flicker (Greenhoe et al. 6). Yet, keeping in view the earlier mentioned advantages, these lanterns are observed to be advantageous for all types of users who have been using them. This was noticed during the survey process associated with this study.

Various scholars have identified different parameters (elements) in case of products based on product marketing mix (Kotler 1-233; Kotler, Keller, Koshy and Jha 23). A more modified version of this marketing mix (shown in Table 1) was observed during the survey process in this study as far as applicability in case of portable solar lanterns is concerned. This was also found to be in line with the views of other scholars including Kumar and Meenakshi (19-23), Panda (300-302), and Stanton, Etzel and Walker (1-102). These above points have also been supported by Baines, Fill and Page (13-18), and Capon and Singh (19). Similar views have also been expressed by other scholars including Baker (149), and Ramaswamy and Namakumari (174-175).

Table 1: Different Parameters (Elements) in case of Portable Solar Lanterns Based on Product Marketing Mix

Sr. No.	Parameters	Sr. No.	Parameters	Sr.	Parameters	Sr.	Parameters
Product:		**Price:**		**Promotion:**		**Place:**	
1	Quality	9	Maximum Retail	14	Advertising	19	Location of retailers
2	Design	10	Discounts	15	Sales Promotion	20	Inventory Availability
3	Features	11	Allowances#	16	Personal Selling	21	Transportation Facilities
4	Brand Name	12	Payment Period	17	Public Relations	22	Accessibility of retailers
5	Packaging	13	Credit Terms	18	Direct		
6	Size	***Source:*** Baines et al. (13 -18); Baker (149); Capon and Singh (19); Kotler (1-233); Kotler et al. (23)**;** Kumar and Meenakshi (19-23); Panda (300-302); Ramaswamy and Namakumari (174-175); Stanton et al. (1-102)					
7	After Sales Services						
8	Warranty						

In Table 1, allowances# (in Sr. No. 11) in case of "price" component of any product is generally of the following types (KULLABS.com):

i) Promotional Allowance: This refers to the reduction of prices equal to an amount that is spent by distributors and retailers for promotional services. Such allowances may be in the form of "advertising allowance, window display materials, training in sales demonstration," etc. (KULLABS.com).

ii) Trade–in–allowance: This refers to price reduction provided for exchanging an old item while purchasing a new one (KULLABS.com).

It was noticed during the survey associated with this study that among the above two types of allowances, only promotional allowance was applicable in case of portable solar lanterns. The reduction in prices of these lanterns due to such allowance has a profound influence upon users' (customers') buying behaviour for the same.

In addition, the survey associated in this study also revealed that accessibility of retailers (Sr. No. 22 in Table 1) was found to be applicable in case of "place" component of the marketing mix for the aforementioned lanterns.

Kumar and Meenakshi (19-23) have also highlighted the fact that any company develops above such product marketing mix based upon its understanding of customers. It is to be noted that the aforesaid parameters of the marketing mix are also applicable in case of portable solar lanterns as shown in Table 1. As per the same scholars, an "effective marketing mix" may be "a source of competitive advantage". Further, it also matches the needs of users (consumers). These views are also supported by Baines et al. (36-88), Kotler et al. (18-26), and Ramaswamy and Namakumari (178-179). Any such needs of users are linked with their perception. The latter is the "organization," "identification,' and "interpretation" of "sensory information in order to portray and understand the environment or any information" presented anywhere (Rao and Krishna 777-781; Robbins, Judge, Millett and Boyle 142-144; Schacter, Gilbert and Wegner 1-20; Schiffman and Kanuk 172-173). As such, it is seen that any study on different elements of the aforesaid marketing mix may be linked with their perception. This is also applicable for any product including portable solar lanterns.

Need for the study:

The present world scenario has witnessed enormous exploitation and subsequent degradation of fossil fuels owing to rampant and unplanned industrialisation. This has been a common scene in many parts of the world including India. As such, there have been tremendous emphasis on development of different sources and methods for generating electric power through the use of renewable sources like water (for hydro electric power plants), solar energy, wind energy, tidal energy, energy generated from wastes etc. Among these, solar energy happens to be an easily available clean source of energy for electrification (Chakrabarti and Chakrabarti 34, 38; Sen and Bhattacharyya 388, 389, 397). In this context, portable solar lanterns can play an essential role. This is particularly true in case of rural homes as well as in urban dwellings. Jacobson (144-146) have stated that solar electrification can be a tool for social change in such areas. Besides, use of solar energy has the following advantages (Karapanagiotis; Saidur, Islam, Rahim and Solangi 1744-1747):

i) There is reduction of "transmission lines from electricity grids."
ii) There is no emission of "greenhouse gases like CO2, NOx" or "toxic gases like SO2."
iii) There is no affect on the "quality of water resources."
iv) There is high increase in "energy independence" of any region or nation.

The aforesaid points have been supported by many other scholars including Solangi, Islam, Saidur, Rahim and Fayaz (2150-2152), Tsoutsos, Frantzeskaki and Gekas (289-294), and Wang and Qiu (2181–2186). In this connection, one may note the example of Israel which was one of the first countries in the world to go for mass installation and use of rooftop solar panels in the 1950's (Robertson). The same scholar also indicated that in Israel around 90% of domestic homes are having solar water heaters. This is in stark contrast in case of India wherein solar installed capacity for electricity generation is around 23 GW as of 30th June, 2018 (MNRE). This capacity is only 6.68 percent of the total installed capacity for electricity in the country (343.89 GW) (CEA 1). In addition, this capacity of 23 GW is also around only 33.32 percent of the total installed capacity for electricity from renewable sources in the country (69.02 GW) (CEA 1). However, there has been significant development in case of solar electrification in the country in the past few years. It is to be noted that in July, 2017, the Indian Railways rolled out its first ever passenger train with rooftop solar panels for generating electricity for lights, fans and information display screens (Eleftheriou-Smith; Ghoshal). Cochin International Airport, located in the city of Cochin in the south Indian state (province) of Kerala, is first airport in the entire world that runs entirely on solar energy (Mullen; Sukumaran and Sudhakar 176-188). In addition, the Union Territory of Diu in western India is completely electrified by solar energy (Williams). Keeping in view high costs and complicacies involved in case of above such installations for solar electrification, it was found to be prudent to focus upon portable solar lanterns. The latter, as explained in the earlier section, has been found to be highly useful particularly for people facing difficulties as far as access to uninterrupted electricity supply are concerned in energy starved areas like Assam in North East India. This was noticed during the survey process in this study. As such, this study has attempted to focus upon such lanterns.

Presently, every business sector all around the world is witnessing immense competition among rival corporate entities. This is also true in case of portable solar lanterns. As per the views of Engeset and Heide (23-33), Lindroth, Ritalahti and Soisalon-Soininen (53-58), and Nair (436-442), satisfying customers is a very important step in this regard. It is to be noted that as per the views of Oliver (3-15), satisfaction is "a consumer's fulfillment response. It is a judgement that a product or service feature, or the product or service itself, provides a pleasurable level of consumption-related fulfillment." As per Abidin (12, 16-20, 112), consumers' perception is related with their satisfaction with respect to any product or service. This has been also supported by Nair (441-443), Schiffman and Kanuk (55-56), and Zeithaml, Bitner, Gremler, and Pandit (114-118). The act of satisfying customers will surely help various manufacturers (companies) of such lanterns to stay ahead in competition with respect to rival entities. The end result of customer satisfaction is customer loyalty (Engeset and Heide 23-33; Lindroth et al. 53-58; Nair 436-442). This has also been stated by Schiffman and Kanuk (27-30). Consequently, this will lead to uninterrupted cash flows and consequent profitability and survivality for their manufacturers and sellers (Nair 442-443). In this regard, a complete understanding of users' (consumers') perception regarding such solar lanterns is essential while formulating proper marketing strategies in order to satisfy them on part of these entities (Schiffman and Kanuk 30). This may help in improving sales and usage of such lanterns in energy starved areas like Assam as mentioned above. This may aid in continuous profitability and survivality of such entities as explained earlier. Therefore, a study on the aforesaid users' perception regarding such solar lanterns is highly important in case of Assam.

Objective of the study:

The objective of this research work is to study users' perception of portable solar lanterns in Guwahati city of Assam. This endeavour may aid in revealing important points regarding these lanterns that need to be emphasized by their manufacturers and sellers while formulating proper marketing strategies in order to improve their sales and usage in the aforesaid city.

Research Methodology:

This study employed exploratory and descriptive research design to fulfil its stated objectives (Aaker, Kumar and Day 1-103). Required data for this study was obtained from both primary and secondary sources. Primary data sources included a sample of 215 respondent users of portable solar lanterns throughout Guwahati city. Survey method was used to collect required primary data. This involved personal interviews of these respondents through the use of a well designed questionnaire. This questionnaire was administered among 300 users of such lanterns. However, only 215 filled questionnaires with all responses (being provided) was obtained. It is to be noted that this questionnaire exhibited high reliability coefficient (Cronbach's α=0.800) that was measured using SPSS software. Required secondary data

was obtained from websites, books, journals etc. The above mentioned sample respondents were selected based on convenience sampling from the study population. Additional information was also collected through unstructured personal interviews of some sellers of such lanterns accompanied by unstructured observation of sellers' premises. The time period of the above data collection process was one year (from 1st April, 2017 to 31st March, 2018). The geographical coverage of this study was Guwahati city as mentioned earlier.

At the beginning, a rough questionnaire was prepared for respondent users of portable solar lanterns within the above city. This questionnaire was administered in a pilot survey involving 10 such respondents. Necessary corrections were carried out in this questionnaire based on the aforesaid pilot survey. In this way, the final questionnaire was prepared after necessary modifications and was used to collect required data for this study.

Next, it was tried to find out the nature of the relationship between demographic variables of respondents with their overall perception regarding portable solar lanterns. It is to be noted the above mentioned demographic variables included respondents' gender, marital status, place of work, educational qualification, age, monthly income, and sector of employment. This was tried to be determined using a series of One-way Analysis of Variance (ANOVA) and Independent Sample t-tests at a significance level of 5% (α= 0.05) (Chawla and Sondhi 323-384; Garret 212-242, 276-295; Levin, Rubin, Siddiqui and Rastogi 542-543; Malhotra and Dash 470-506; Mishra 326-331) using SPSS software. For this purpose, the above mentioned respondents' overall perception regarding these lanterns was treated as the dependent variable and their demographic variables were treated as the independent variables. The aforementioned respondents' overall perception was measured in five levels (using a 5-point scale). These levels, in descending order from highest to lowest, are "Excellent", "Good", "Average", "Below Average", and "Poor" respectively. It may be noted that Independent Sample t-tests were used whenever there were two groups (categories/levels) of the independent variable. Whenever number of such groups was more than two, One-way ANOVA was used (Bajpai 309-408; Chawla and Sondhi 323-384; Malhotra and Dash 470-506; Mishra 326-331; Phanse 367-382). The aforementioned statistical tests were used to examine whether there existed significant differences among (or between) the means of the above dependent variables with respect to various categories of demographic (independent) variables (Aaker et al. 431-503; Chawla and Sondhi 323-384; Cooper, Schindler and Sharma 568-572, 619, 798; Garret 212-242, 276-295; Levin et al. 365-463, 542-583; Malhotra and Dash 470-506; Mishra 326-331). Thereafter, it was attempted to find out the demographic variables wherein significant differences among the above means existed (p-value less than α= 0.05). The value of the above means of the dependent variable with respect to different groups (categories) of the independent variable may represent the nature of relationship between these two variables. Through this process, it was tried to identify the category/ies of respondents based on these demographic (independent) variables wherein the above mean was highest compared to other means. This indicated the category/ies of such respondent users, as explained, which required high emphasis on the part of manufacturers and sellers of portable solar lanterns in order to augment their sales and usage (Aaker et al. 431-503; Chawla and Sondhi 323-384; Cooper et al. 568-572, 619, 798; Malhotra and Dash 470-506).

Next, it was tried to find out those parameters among 23 such parameters of portable solar lanterns (refer to Table 1) including any other parameter (not mentioned in this table) wherein perception of respondent users were "Excellent" and "Good". A similar procedure was also employed in another study by Goswami, Barman and Sarmah (27-53). This was followed by an attempt to identify the nature of the relationship between respondents' perception regarding these identified parameters of the above solar lanterns and their overall perception regarding such lanterns. Here also, a series of One-way ANOVA and Independent Sample t-tests were used as explained above. This involved treatment of the aforesaid respondents' overall perception regarding these lanterns as dependent variable and their perceptions regarding each of the above mentioned individual parameters of such lanterns as independent variables. The aforementioned overall respondents' perception was measured in five levels (using a 5-point scale) in a similar manner as mentioned in the sixth sentence of the earlier third paragraph of this section, Research Methodology. In this manner, as noted earlier, it was tried to check the presence of significant differences among (or between) the means of the above dependent variables with respect to various levels of independent variables. This was followed by an attempt to identify the specific independent variables wherein such significant differences among (or between) the above means existed (p-value less than α= 0.05). Here, the independent

variables wherein the above mean of dependent variable was higher in case of higher levels of perception (relating to the independent variables), and were decreasing in a linear descending manner from higher to lower levels of the aforesaid perception (for independent variables) were noted.

The above analyses attempted to indicate the specific individual parameters of portable solar lanterns (as indicated in Table 1) which required high emphasis on the part of their manufacturers and sellers for increasing their sales and usage.

Through the above explained methodology, it was tried to attain the study objectives. Through the above steps, this study also tried to reveal important points that needed to be stressed upon for increasing sales and usage of the above mentioned lanterns.

Limitations of the study:

This study was carried out involving a small sample of 215 respondents within Guwahati city of Assam. Again, convenience sampling method was employed in this study with its inherent limitations. So, the findings of this study may not be generalized.

Analysis and Findings:

1. Demographic Profile of Respondents:

A thorough analysis of the respondent users' demographic profile indicated that most of them were males (60.50%) and married (81.40%). It was also noticed that most of them were working inside North East India (90.20%), and graduate (68.80%). Besides, the study also indicated that most of them were between 41 to 50 years in age (49.30%), with monthly income between Rs.30,001 to Rs.50,000 (49.30%), and mostly employed in the public sector (25.10%) or were running their own businesses (25.10%). These findings are shown in Table A-1 in the Annexure.

2. Respondents' Demographic Profile and their Overall Perception regarding Portable Solar Lanterns:

Findings from One-way ANOVA indicated that the null hypothesis that there exists no significant differences among the means of respondent users' overall perception regarding portable solar lanterns with respect to their various sectors of employment can be rejected (p-value less than $\alpha = 0.05$). These observations are shown in Table A-2 in the Annexure. As such, there existed significant differences among the above means based on different sectors of employment. It was found from descriptive statistics that the aforesaid mean in case of respondent users belonging to "Self Employed-Professional" category was comparatively highest with respect to similar means relating to other sectors of employment (refer to Table A-2). This implied that self employed professionals like physicians, lawyers, architects etc. have higher sensitivity as regards their perception regarding such solar lanterns are concerned. Similar analyses indicated high sensitivity in case of those users who were "between 41 to 50 years" in age, and those with monthly income "between Rs.30,001 to Rs.50,000" for such lanterns. Therefore, manufacturers and sellers of such lanterns should heavily focus on the following categories of users for augmenting their sales and usage:

i) Self employed as professionals, or

ii) Between 41 to 50 years in age, or

iii) With monthly income between Rs.30,001 to Rs.50,000.

However, from results of One-way ANOVA, it was noticed that there were no significant differences among the means of respondent users' overall perception regarding portable solar lanterns with respect to their gender (p-value more than $\alpha = 0.05$ (refer to Table A-2 in the Annexure)). Therefore, it may be concluded that relationship between the aforementioned overall perception regarding these lanterns and gender was irrelevant (Chawla and Sondhi 323-384; Malhotra and Dash 470-506; Mishra 326-331; Phanse 367-382). Similarly, it was also found that relationship between such overall perception and educational qualification was also immaterial. In addition, the outcome of Independent Sample t-test indicated that the null hypothesis that there exists no significant differences between the means of respondent users' overall perception regarding portable solar lanterns across their marital status cannot be rejected (p-value more than $\alpha = 0.05$). This implied that there were no significant differences between the above means in relation to respondent users' marital status (refer to Table A-2). So, it may be stated that relationship between the aforementioned overall perception regarding these lanterns and marital status was irrelevant. Likewise, it was also found that relationship between such overall perception and place of residence was also immaterial. It is to be noted that Independent Sample t-test was carried out in case of marital status and place of residence owing to the fact that responses could be obtained with respect to only two categories (groups) in case of each of these demographic variables (refer to Table A-2 and Research Methodology). As such, manufacturers and sellers

of such solar lanterns may put moderate emphasis on users' gender, marital status, place of residence, and educational qualification while framing marketing strategies of such lanterns for increasing their sales and usage.

3. Respondents' Perception regarding Various Parameters of Portable Solar Lanterns and their Overall Perception regarding such Lanterns:

It was noticed from Table A-3 in the Annexure that respondents exhibited "Excellent" and "Good" perception in case of the following 18 parameters of portable solar lanterns (refer to Table 2) out of 23 such parameters mentioned in Table 1 (including any other parameters not mentioned in this table):

Table 2: Parameters of Portable Solar Lanterns wherein Respondents exhibited "Excellent" and "Good" Perception

Sr. No.	Parameters	Sr. No.	Parameters	Sr. No.	Parameters	Sr. No.	Parameters
Product:		**Price:**		**Promotion:**		**Place:**	
1	Quality	8	Maximum Retail Price	11	Advertising	16	Location of retailers
2	Design	9	Allowances	12	Sales Promotion	17	Transportation Facilities
3	Features	10	Credit Terms	13	Personal Selling	18	Others
4	Brand Name			14	Public Relations		
5	Packaging			15	Direct Marketing		
6	Size						
7	After Sales Services						

As per Abidin (12, 16-20, 112), Nair (441-443), Schiffman and Kanuk (55-56), and Zeithaml et al., (114-118), as mentioned earlier, it may be inferred that respondent users experienced satisfaction with respect to the above mentioned 18 parameters of portable solar lanterns. As such, these 18 parameters of such lanterns should be given high importance while formulating any marketing strategies for the purpose of increasing their sales and usage on part of their manufacturers and sellers. It is to be further noted that the overall perception of most of these respondents was "Good" regarding these lanterns (78.60%) (refer to Table A-4 in the Annexure). This observation further reflects satisfaction of these respondents regarding such lanterns as noted earlier.

Findings from One-way ANOVA indicated that the null hypothesis that there exists no significant differences among the means of respondent users' overall perception regarding portable solar lanterns with respect to their various levels of perception for quality (of such lanterns) can be rejected (p-value less than •= 0.05). These observations are shown in Table A-5 in the Annexure. This implied presence of significant differences among the above means based on various levels of perception for quality (of such lanterns). From descriptive statistics, it was seen that the aforesaid mean in case of "Excellent" perception was relatively highest in comparison to similar means relating to other levels of perception for quality. On the other hand, it was found that the above means in case of "Average" perception was relatively lowest relative to similar means for other levels of perception for quality. These results indicated a linear positive relationship between levels of users' overall perception about portable solar lanterns and levels of their perception regarding quality of these lanterns (refer to Figure A-1 in the Annexure). It is to be noted that there were no responses in case of "Below Average" and "Poor" perception relating to quality of such lanterns. This implied that, in the above case, those users' who have "Excellent" overall perception will also have "Excellent" perception regarding quality. However, in the above regard, those users' who have "Average" overall perception will also have "Average" perception regarding quality. Similar linear positive relationship was also noticed between respondent users' overall perception and their perception regarding the following parameters of these lanterns (refer to Table A-5 and Figure A-1 in the Annexure):

I) Design (refer to Figure A-2 in the Annexure),

ii) Features (refer to Figure A-3 in the Annexure),

iii) Packaging (refer to Figure A-5 in the Annexure),

iv) Maximum Retail Price (refer to Figure A-8 in the Annexure), and

v) Personal Selling (refer to Figure A-12 in the Annexure).

The above findings imply that manufacturers and sellers of such lanterns should heavily focus on the above parameters of portable solar lanterns for augmenting their sales.

It is to be noted that Independent Sample t-test was conducted to ascertain whether there existed significant differences between the above means of respondent users' overall perception regarding portable solar lanterns in relation to their various levels of perception for credit terms (of such lanterns). This was because responses could be obtained regarding only two levels of perception about credit terms (of these lanterns), namely, for "Good" and "Average" perception (refer to Table A-5 in the Annexure). The results of this analysis showed that the null hypothesis that there exists no significant differences between the means of respondent users' overall perception regarding such lanterns with respect to their various levels of perception for the aforementioned credit terms can be rejected (p-value less than •= 0.05 (refer to Table A-5)). This indicated existence of significant differences between the above means as explained earlier. Descriptive statistics indicated that the aforesaid means in case of "Good" perception was relatively higher in comparison to similar means relating to the other level of perception for credit terms. On the other hand, it was found that the above means in case of "Average" perception was relatively lower in the above case. Therefore, it is seen that there existed a linear relationship between respondent users' overall perception and their perception regarding credit terms of these lanterns (refer to Figure A-9 in the Annexure). So, manufacturers and sellers of these lanterns should also emphasize on such credit terms for improving their sales and usage.

Table A-5 in the Annexure also revealed complete absence of similar positive linear relationship between respondent users' overall perception and their perception regarding the following ten (10) parameters of portable solar lanterns. This was noted inspite of the existence of significant differences among the means of respondent users' overall perception of these lanterns based on various levels of perception for each of these ten (10) parameters (of such lanterns).

I) Brand Name (refer to Figure A-4 in the Annexure),
ii) Size (refer to Figure A-6 in the Annexure),
iii) After Sales Services (refer to Figure A-7 in the Annexure),
iv) Advertising (refer to Figure A-10 in the Annexure),
v) Sales Promotion (refer to Figure A-11 in the Annexure),
vi) Public Relations (refer to Figure A-13 in the Annexure),
vii) Direct Marketing (refer to Figure A-14 in the Annexure),
viii) Location of Retailers (refer to Figure A-15 in the Annexure),
ix) Transportation Facilities (refer to Figure A-16 in the Annexure), and
x) Other Parameters (refer to Figure A-17 in the Annexure).

Therefore, manufacturers and sellers of portable solar lanterns may put moderate importance on the above ten (10) parameters of such lanterns while formulating marketing strategies in order to improve their sales and usage.

It was also noticed from the outcome of One-way ANOVA that there were no significant differences among the means of respondent users' overall perception regarding portable solar lanterns (as explained above) with respect to their various levels of perception for allowances (of such lanterns) (p-value more than •= 0.05 (refer to Table A-5 in the Annexure)). This indicated that the relationship between the aforementioned overall perception regarding these lanterns and perception regarding allowance for the same was unimportant (Malhotra and Dash 470-506; Mishra 326-331; Phanse 367-382). As such, manufacturers and sellers of such solar lanterns may put moderate emphasis on allowances while framing marketing strategies of such lanterns for increasing their sales and usage.

Discussion:

The findings of this study have revealed some important issues that need to be emphasized by manufacturers and sellers of portable solar lanterns for improving their sales and usage. This study has indicated that such entities should stress upon the following categories of potential and existing users of these lanterns for the above purpose:

I) Self employed as professionals, or
ii) Between 41 to 50 years in age, or
iii) With monthly income between Rs.30,001 to Rs.50,000.

The above manufacturers and sellers should give immense importance on 18 parameters of portable solar lanterns while making any marketing strategies for the purpose of increasing their sales and usage. These parameters include quality, design, features, brand name, packaging, size, after sales services, maximum retail price, allowances, credit terms, advertising, sales promotion, personal selling, public relations, direct marketing, location of retailers,

transportation facilities and other parameters. In addition, it was also noticed that among the above 18 parameters of such lanterns, these should be special focus on the following seven (7) parameters on part of these manufacturers and sellers:

I) Quality
ii) Design,
iii) Features,
iv) Packaging,
v) Maximum Retail Price,
vi) Credit Terms, and
vii) Personal Selling.

The above findings are very significant regarding perceptions of potential and existing users of portable solar lanterns. These are highly essential for creating and implementing proper marketing strategies for attaining satisfied users (customers) in case of such lanterns and thereby retaining them as loyal customers (users) (Nair 442-443). This endeavour may spearhead continued profitability and survivability of any manufacturers and sellers of such lanterns.

Conclusion:

Solar energy is an indispensable source of energy for the current and future energy sector. In fact, it is highly essential as a source of energy for electrification in energy starved areas like the province (state) of Assam and India in general. It is to be noted that this form of energy has already been used for lighting portable solar lanterns nowadays. Findings from this study have revealed few important points that need be stressed upon by their manufacturers and sellers while formulating marketing strategies for increasing their sales and consequent usage.

In addition, it is expected that this study will open further opportunities to carry forward similar research work in other parts of India and the world in general. Such studies may involve a larger sample size involving more parameters (beyond four P's of Product Marketing Mix) in case of portable solar lanterns or any such identical or synergic products.

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ANNEXURE

Table A-1: Demographic Profile of Respondents

Gender	**Frequency**	**Percent**	**Marital status**	**Frequency**	**Percent**
Male	**130**	**60.50**	Single	40	18.60
Female	82	38.10	**Married**	**175**	**81.40**
Transgender	3	1.40	**Total**	**215**	**100.00**
Total	**215**	**100.00**	**Educational Qualification**	**Frequency**	**Percent**
Place of work	**Frequency**	**Percent**	Below 10th Board	3	1.40
Inside North East India	**194**	**90.20**	10th Board Passed	0	0.00
Outside North East India	21	9.80	12th Board Passed	1	0.50
Total	**215**	**100.00**	**Graduate**	**148**	**68.80**
Age	**Frequency**	**Percent**	Post Graduate	63	29.30
Below 20 years	2	0.90	**Total**	**215**	**100.00**
Between 20 to 30 years	31	14.40	**Monthly income**	**Frequency**	**Percent**
Between 31 to 40 years	43	20.00	Below Rs.10,000	43	20.00
Between 41 to 50 years	**106**	**49.30**	Rs.10,001 to Rs.30,000	22	10.20
Between 51 to 60 years	19	8.80	**Rs.30,001 to Rs.50,000**	**106**	**49.30**
Above 60 years	14	6.50	Rs.50,001 to Rs.70,000	41	19.10
Total	**215**	**100.00**	Rs.70,001 to Rs.90,000	3	1.40
Sector of employment	**Frequency**	**Percent**	Above Rs.90,000	0	0.00
Employee- Private Sector	51	23.70	**Total**	215	100.00
Employee- Public Sector	**54**	**25.10**			
Self Employed- Business	**54**	**25.10**			
Self Employed- Professional	21	9.80			
Student	21	9.80			
Housewife	14	6.50			
Total	**215**	**100.00**			

Table A-2: Independent Sample t-test and ANOVA- Overall Perception (Dependent Variable (DV)) and Perception regarding Individual Parameters (Independent Variables (IV)) of Portable Solar Lanterns

Sr. No.	Demographic Variables	Statistical Test	Name of the Variables	N	Mean	p-value	Result of Hypothesis Testing
1	Gender	ANOVA	Male	130	4.04	0.351	*H_0 cannot be rejected*
			Female	82	4.00		
			Transgender	3	3.67		
2	Marital Status	IST	Single	40	3.98	0.244	*H_0 cannot be rejected*
			Married	175	4.03		
3	Sector of Employment	ANOVA	Employee- Private Sector	51	3.98	0.000	H_0 rejected
			Employee- Public Sector	54	3.98		
			Self Employed- Business	54	3.91		
			Self Employed- Professional	***21***	***4.52***		
			Student	21	4.00		
			Housewife	14	4.00		
4	Place of	IST	Inside North East India	194	4.02	0.557	*H_0 cannot be rejected*
			Outside North East India	21	4.00		
5	Educational Qualification	ANOVA	Below 10th Board	3	3.67	0.577	*H_0 cannot be rejected*
			Passed 12th Board	1	4.00		
			Graduate	148	4.03		
			Post Graduate	63	4.00		
6	Age	ANOVA	Below 20 years	2	4.00	0.000	H_0 rejected
			Between 20 to 30 years	31	4.00		
			Between 31 to 40 years	43	3.95		
			Between 41 to 50 years	***106***	***4.19***		
			Between 51 to 60 years	19	4.00		
			Above 60 years	14	3.00		
7	Monthly Income	ANOVA	Below Rs.10,000	43	3.98	0.000	H_0 rejected
			Rs.10,001 to Rs.30,000	22	4.00		
			Rs.30,001 to Rs.50,000	***106***	***4.19***		
			Rs.50,001 to Rs.70,000	41	3.71		
			Rs.70,001 to Rs.90,000	3	3.00		

ANOVA - One-Way ANOVA, **IST-** Independent Sample t-test

Table A-3: Respondents' Perception regarding Various Parameters of Portable Solar Lanterns

Sr. No.	Parameters	Excellent		Good		Average		Below Average		Poor	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1	Quality	***106***	***49.30***	88	40.90	21	9.80				
2	Design	66	30.70	***126***	***58.60***	23	10.70				
3	Features	46	21.40	***127***	***59.10***	42	19.50				
4	Brand Name	42	19.50	***112***	***52.10***	58	27.00	1	0.50	2	0.90
5	Packaging	70	32.60	***144***	***67.00***	1	0.50				
6	Size	70	32.60	***80***	***37.20***	65	30.20				
7	After Sales Services	44	20.50	***125***	***58.10***	46	21.40				
8	Warranty	69	32.10	45	20.90	***101***	***47.00***				
9	Maximum Retail Price	45	20.90	***150***	***69.80***	20	9.30				
10	Discounts	25	11.60	88	40.90	***102***	***47.40***				
11	Allowances			***194***	***90.20***	21	9.80				
12	Payment Period	20	9.30	87	40.50	***108***	***50.20***				
13	Credit Terms			***127***	***59.10***	88	40.90				
14	Advertising	22	10.20	***131***	***60.90***	62	28.80				
15	Sales Promotion	22	10.20	***110***	***51.20***	83	38.60				
16	Personal Selling	25	11.60	***125***	***58.10***	65	30.20				
17	Public Relations	20	9.30	***129***	***60.00***	63	29.30	3	1.40		
18	Direct Marketing	***63***	***29.30***	41	19.10	43	20.00	45	20.90	23	10.70
19	Location of Retailers	22	10.20	***110***	***51.20***	83	38.60				
20	Inventory Availability	18	8.40	88	40.90	***109***	***50.70***				
21	Transportation Facilities			***171***	***79.50***	43	20.00	1	0.50		
22	Accessibility of retailers			107	49.80	***108***	***50.20***				
23	Others			***106***	***49.30***	84	39.10			25	11.60

Note: Shaded empty cells represent "non response".

Table A-4: Respondents' Overall Perception regarding Portable Solar Lanterns

Respondents' Overall	Frequency	Percent
Excellent	25	11.63
Good	***169***	***78.60***
Average	21	9.77
Below Average		
Poor		
Total	215	100.00

Note: Shaded empty cells represent "non response".

Table A-5: Independent Sample t-test and ANOVA- Overall Perception (Dependent Variable (DV)) and Perception regarding Individual Parameters (Independent Variables (IV)) of Portable Solar Lanterns

Sr. No.	Parameters	Statistical Test	Excellent		Good		Average		Below Average		Poor			Result of Hypothesis Testing	Presence of Linear Positive Relationship Between DV
			N	Mean	N	Mean	N	Mean	N	Mean	N	Mean			
1	***Quality***	***ANOVA***	***106***	***4.24***	***88***	***3.99***	***21***	***3.05***					***0.000***	***H_0 rejected***	***Present***
2	***Design***	***ANOVA***	***66***	***4.38***	***126***	***4.00***	***23***	***3.09***					***0.000***	***H_0 rejected***	***Present***
3	***Features***	***ANOVA***	***46***	***4.54***	***127***	***3.99***	***42***	***3.52***					***0.000***	***H_0 rejected***	***Present***
4	Brand Name	ANOVA	42	4.00	112	4.22	58	3.66	1	3.00	2	4.00	0.000	H_0 rejected	Not present
5	***Packaging***	***ANOVA***	***70***	***4.36***	***144***	***3.86***	***1***	***3.00***					***0.000***	***H_0 rejected***	***Present***
6	Size	ANOVA	70	4.36	80	3.74	65	4.00					0.000	H_0 rejected	***Present***
7	After Sales	ANOVA	44	3.98	125	4.10	46	3.85					0.006	H_0 rejected	Not present
8	***Maximum Retail***	***ANOVA***	***45***	***4.56***	***150***	***3.99***	***20***	***3.00***					***0.000***	***H_0 rejected***	***Present***
9	Allowances	ANOVA			194	4.03	21	3.95					0.492	H_0 cannot	Not present
10	***Credit Terms***	IST			127	4.19	88	3.77					0.000	H_0 rejected	***Present***
11	Advertising	ANOVA	22	4.00	131	4.18	62	3.68					0.000	H_0 rejected	Not present
12	Sales Promotion	ANOVA	22	4.00	110	4.22	83	3.76					0.000	H_0 rejected	Not present
13	***Personal Selling***	***ANOVA***	***25***	***5.00***	***125***	***4.00***	***65***	***3.68***					***0.000***	***H_0 rejected***	***Present***
14	Public Relations	ANOVA	20	4.00	129	4.19	63	3.68	3	3.67			0.000	H_0 rejected	Not present
15	Direct Marketing	ANOVA	63	4.40	41	4.00	43	4.00	45	4.00	23	3.09	0.000	H_0 rejected	Not present
16	Location of	ANOVA	22	4.00	110	4.22	83	3.76					0.000	H_0 rejected	Not present
17	Transportation	ANOVA			171	4.15	43	3.51	1	4.00			0.000	H_0 rejected	Not present
18	Others	ANOVA			106	4.00	84	3.75			25	5.00	0.000	H_0 rejected	Not present

ANOVA - One-Way ANOVA, **IST-** Independent Sample t-test

Figure A-1: Mean of Overall Perception across Levels of Perception for Quality

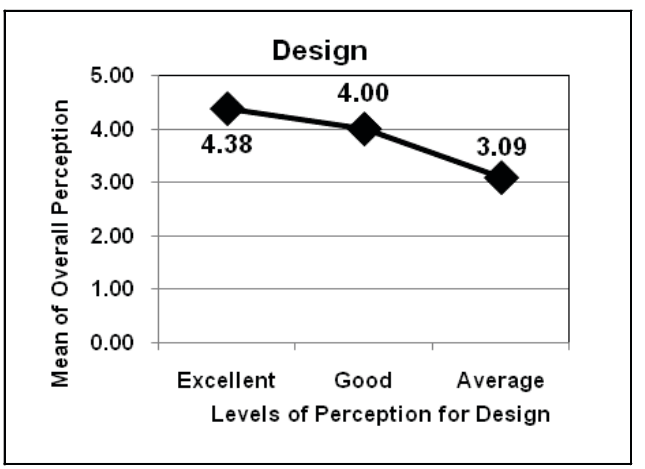

Figure A-2: Mean of Overall Perception across Levels of Perception for Design

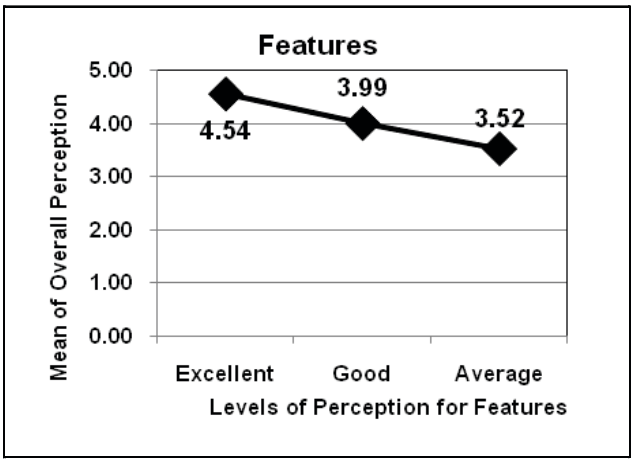

Figure A-3: Mean of Overall Perception across Levels of Perception for Features

Figure A-6: Mean of Overall Perception across Levels of Perception for Size

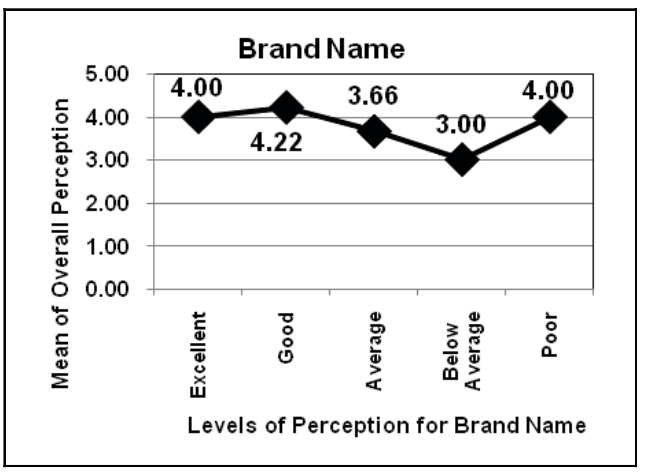

Figure A-4: Mean of Overall Perception across Levels of Perception for Brand Name

Figure A-7: Mean of Overall Perception across Levels of Perception for After Sales Service

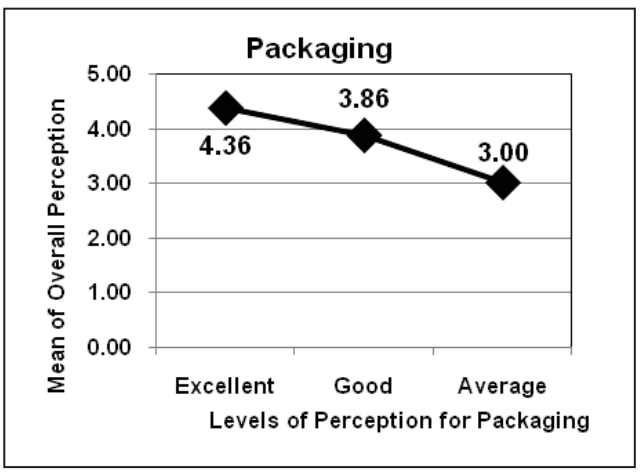

Figure A-5: Mean of Overall Perception across Levels of Perception for Packaging

Figure A-8: Mean of Overall Perception across Levels of Perception for Maximum Retail Price

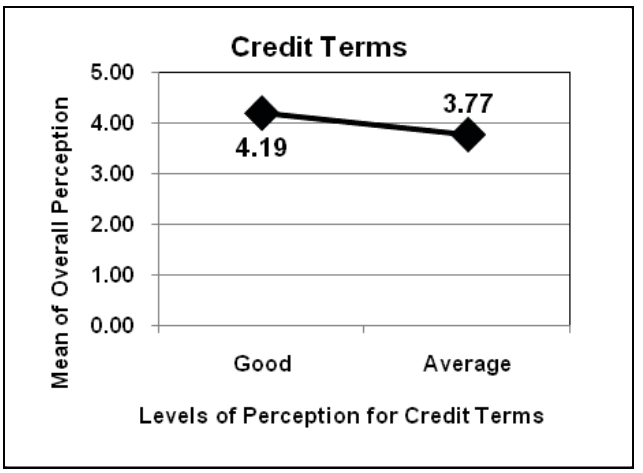

Figure A-9: Mean of Overall Perception across Levels of Perception for Credit Terms

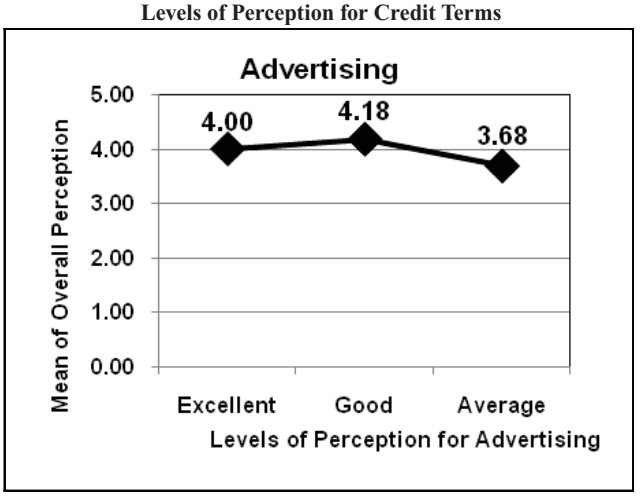

Figure A-10: Mean of Overall Perception across Levels of Perception for Advertising

Figure A-11: Mean of Overall Perception across Levels of Perception for Sales Promotion

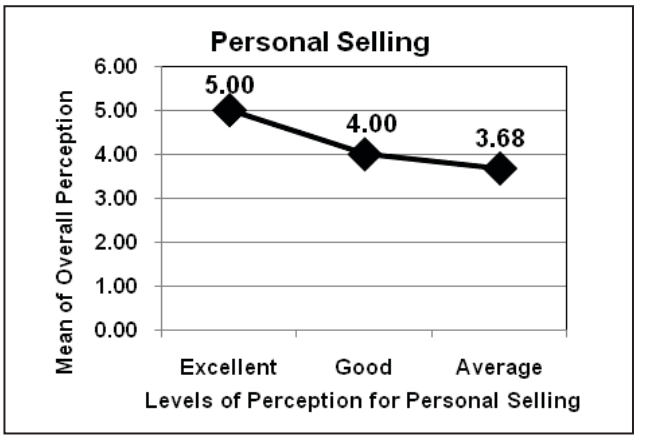

Figure A-12: Mean of Overall Perception across Levels of Perception for Personal Selling

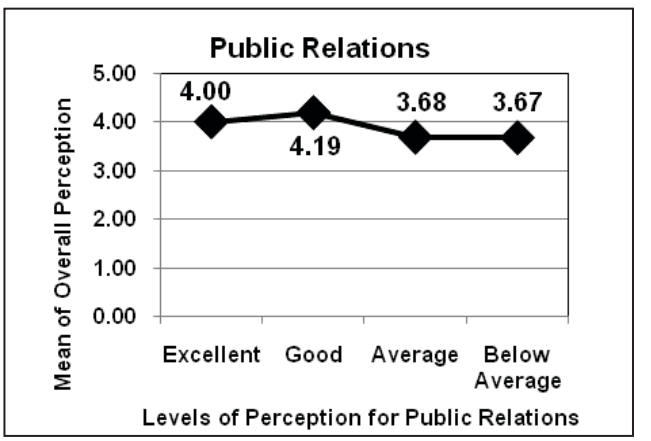

Figure A-13: Mean of Overall Perception across Levels of Perception for Public Relations

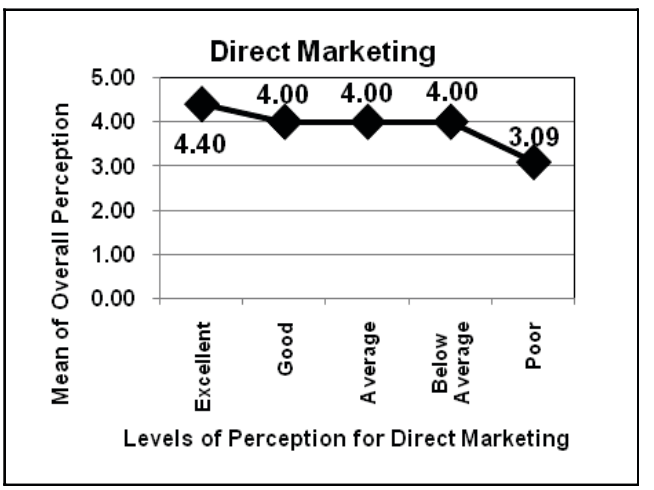

Figure A-14: Mean of Overall Perception across Levels of Perception for Direct Marketing

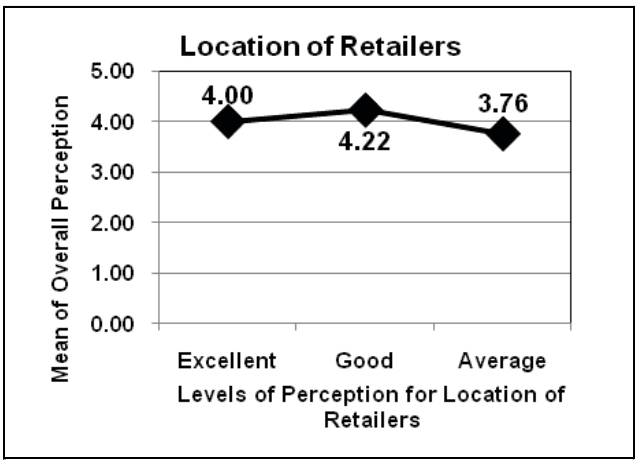

Figure A-15: Mean of Overall Perception across Levels of Perception for Location of Retailers

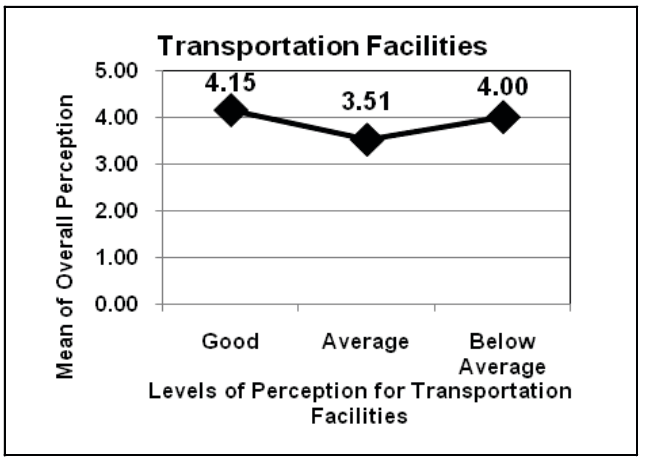

Figure A-16: Mean of Overall Perception across L evels of Perception for Transportation Facilities

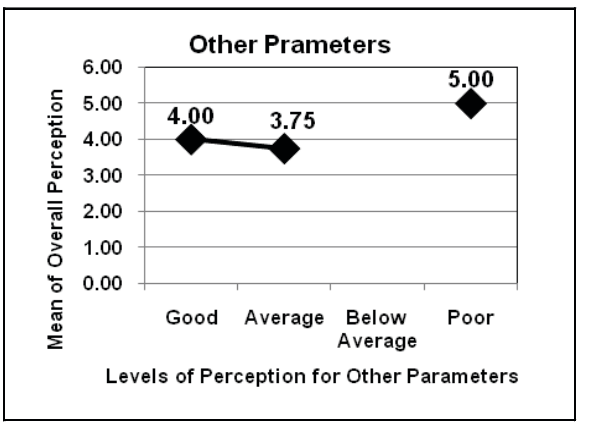

Figure A-17: Mean of Overall Perception across Levels of Perception for Other Parameters

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Role of Product Experience in Product Purchase: Indian Users

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Abstract

A quantitative survey-based user study was conducted among 126 Indian users to understand the effects of the various product, package, and brand-related attributes on CPG purchase decision making. The scope of the survey was the general purchase of CPG products, and not specific to any category. Results from the study revealed that 'good usage experience' and quality of the product are the two most important factors for the users. By performing statistical analysis using a t-test, the study confirmed that importance of 'good usage experience' is significantly higher than brand and package related attributes with a p-value of <0.001. Further, good user experience was also identified as the most important factor for purchase satisfaction and repeat purchase.

Keywords: *Product Experience, Indian Users, User Behavior, User-Brand relationship.*

Consumer packed goods (CPG) industry in India is fast growing and offering tremendous opportunities to companies. The CPG sector in India is expected to grow from US$ 52.75 billion in 2017-18 to US$ 103.7 billion by 2020, suggesting an annual growth rate of 27.86% (IBEF, 2018). The main contributors to this growth are, changing lifestyle, increase in disposable income, growing awareness and easier access to products. Indian users buy several CPG products on daily basis. This is mainly because Indian users generally do not have a habit of buying a monthly stock of products due to their value consciousness (Kaur & Singh, 2007). Users are influenced by several factors when a purchase decision is made. Many of the purchase decisions, especially impulsive buying decisions are made at the store (Rook, 1987; Beatty & Ferrel, 1998) while planned purchasing decisions are made before entering the store (Yazdanpanah & Forouzani, 2015). It is important for product designers and marketing managers to get a deeper understanding of these factors, for developing market-winning product innovations (Betterman et al., 1998). Current research aims to gain an understanding of the importance of various product, package, and brand-related attributes on Indian users' CPG purchase.

Literature Review

Researchers classify purchasing into planned and impulsive purchases (Cobb & Hoyer, 1986). Users in CPG purchase are influenced by various factors in their process of purchase decision making. Bellini et al., (2016) studied users in grocery shopping and found that level of preparation before shopping influences user behavior in the store. They suggested that users with a higher level of preparation have a greater tendency to do planned purchasing, in which decisions are made outside the store. Peck & Childers (2006) suggested that individual and environmental touch-related factors have a positive effect on impulsive buying. Users may also employ a phased decision-making process, starting with a broad set of available choices, filter them and compare within a reduced consideration set to make the final decision (Li et al., 1999). According to Kaas (1982), users forming habitual buying behavior reduce information search process and shift from product specific to brand specific attributes. Over the past few decades, several researchers have investigated the effect of various factors on user's attitude towards brands and purchase intention. Literature of review of various brand, product, and package related attributes was performed to develop a foundational understanding of current research.

Brand Related Attributes

Branding means much more than a brand name. Brands of varying size, shapes, and several other features are available to users to choose based on their choice (Sheena & Naresh, 2012). Within the broad area of brand attributes, factors like brand name, advertisements, word of mouth (WOM), value for money, and country of origin are reviewed.

Brand Name: The brand name has a strong effect on purchase decisions. Brands that are perceived to be more familiar have a higher likeliness of getting purchased. By studying the Chinese automobile industry, Wang & Yang (2010), suggested that brand credibility: a collective combination of brand attractiveness, trustworthiness and brand expertise, has a positive influence on users' purchase intention. Online shoppers use Brand familiarity as internal information in making purchase decisions (Park & Stoel, 2005). Brand name plays a role in brand personality formation (Klink, 2000; Klink & Athaide, 2011) and provides a strong value in differentiating the brands (Río et al., 2001).

Advertisements: Within advertisements, three factors such as advertisements, celebrity used in the advertisements, and salespersons recommendation are reviewed. Buil et al. (2013), showed that users' attitude towards advertisements is an important factor in building brand equity, as they can contribute to positive brand perceptions and higher brand awareness. Use of celebrities such as sportspersons, movie stars and entertainers to promote products is also widespread in global markets (Pornpitakpan, 2004). These celebrities could influence user perception of the brand by influencing the brand personality (Aaker, 1997). Product endorses, and celebrities used in advertising can have personalities that fit those of the brands. Over time, the personalities of the endorsers would be conveyed to the brand (Aaker, 1997). Celebrity credibility dimensions like trustworthiness, attractiveness, and expertise also have a positive effect on purchase intention (Pornpitakpan, 2004). Users also rely on salespersons recommendation for information gathering. However, the impact of recommendation from sales consultants is low for CPG products, because of their perceived monetary gain from the sales (Sebastian, et al., 2018). User-oriented selling approaches from salespersons could increase user satisfaction, which in turn positively affect user satisfaction with the brand (Goff et al., 1997).

WOM: Word of mouth (WOM), especially opinion from family and friends and ratings and reviews influences users'

perception about products. Family and friends' recommendation influence users' attitude towards brands and purchase intention. Information provided by the family influences the perceived quality of the products and formation of brand associations (Gil et al., 2007). Park et al., (2007) suggested that both the quality and quantity of online user reviews have a positive effect on purchase intention. Users with low-involvement could be influenced by the number of reviews while high involvement users influenced by quality as well as quantity.

Country of Origin: Country of origin is another brand related attribute that could influence user perception of the product. Country of origin refers to the country where the product is made. According to Pappu et al., (2006) county of origin influences user-perceived brand equity, and its effects are noticeable when there is a significant difference between the countries in terms of user-perceived country-category associations. Kinra (2006) investigated Indian users' perception of foreign brands and found that foreign brands have higher quality and value perception.

Value for Money: Pricing of the product has an impact on quality perception and purchase intention. Dodd et al., (1991) suggested that higher price has a positive effect on perceived quality, however, it has a negative effect on value perception and purchase intention. Macdonald & Sharp (2000) showed that higher price results in a lower purchase incidence.

Product Related Attributes

Product attributes such as quality of the product, usage experience, fragrance, the efficacy of the product, and the texture of the product are reviewed.

Usage Experience: Product experience from trial influences users' assessment of brand equity (Washburn et al., 2000). Product experience could positively contribute to brand loyalty when users are able to associate the product experience with the perceived quality of the product (Selnes, 1993). Product experience plays an important role in user satisfaction. User satisfaction is a result of expectation at purchase and post-purchase experience in comparison with the price paid (Aydin and Özer, 2005).

Quality of the Product: Role of the quality of the product on purchase intention has been widely studied by academic researchers. Perceived quality has a direct effect on customer trust, and thus indirectly affects customer loyalty (Panjakajornsak & Marakanon, 2017). Perceived quality mediates the effects of brand awareness on purchase intention (Chi et al., 2009). By studying private label product users in France, Mejri & Bhatli (2014), suggested that communication of 'social quality' improved quality perception and brand loyalty. Clavo-Porral & Lévy-Mangin (2017) studied the effect of perceived quality of store brands purchase intention and suggested that purchase intention is strongly influenced by quality perception and product price.

Efficacy: Cooper & Kleinschmidt (1987) studied successful product innovations and suggested that product superiority is the number one factor for the market success of the innovation. According to them, product superiority has multiple dimensions including the unique benefit for the users, quality, value for money, product innovativeness, perceived product superiority and effectiveness in providing a solution to the users' problem.

Fragrance: With competition ever increasing in all categories of CPG products, the difference between competing products become less obvious to the users. This makes it important for marketers to explore possibilities of using sensory research especially 'smell' as a marketing tool. This is especially very important in categories like skin care, body cleansing, fabric care, and home care categories in which the fragrance can be a primary driver for purchase decision (Milotic, 2006).

Texture: Appearance of the product could influence users' product selection in several ways (Creusen and Schoormans, 2005). Based on literature reviews and qualitative user studies, Creusen and Schoormans (2005), shown that product appearances could have aesthetic and symbolic values to the users. Further, it can also communicate functional characteristics and provide an impression about the quality of the product and usability.

Package Related Attributes

Package design plays a great role in influencing purchasing decisions as many of the purchase decisions are made at the point of sale. According to Prendergast and Pitt (1996), the packaging is one of the most important factors in point of sale purchase decisions. Aesthetically appealing packages help in generating user attention by breaking through the competitive clutter (Silayoi and Speece, 2004). Design elements of the product package have an effect on choosing, getting attracted, liking and purchasing the product (Vyas, 2015). Pack size and shape also could influence purchase decisions. Users often relate bigger packs to better value (Prendergast and Marr, 1997).

Convenience of the package: Sehrawet and Kundu (2004), studied the role of convenience of packaging on buying behavior of rural and urban users in India, and found that urban users are influenced by ease of carriage and package weight, while users from rural area are relatively more influenced by ease of storage of the package.

Beautiful look of the package: Several researchers suggested that beautiful look of the package has a positive effect on purchase intention. By studying female skincare users in Indore, a major city in India; Khan and Khan (2013), suggested that products with attractive packages have a perception of higher quality. By studying CPG packages in the Indian context, Gopal and George (2014), suggested that creative elements in packaging could trigger product purchase. Riaz et al., (2015), showed that attractive packaging designs have a strong influence on the purchase intention of female users in the cosmetics category. Shekhar and Raveendran (2015), assessed the chocolate purchase behavior of senior citizens in Kerala and remarked that visual and informative cues on the package have a positive correlation to purchase decisions.

Color & Shape of the package: By studying role of various package design elements such as color, material of the package, typography etc., on purchase intention of dairy product users in Zimbabwe, Mutsikiwa and Marumbwa (2013), suggested that packages in which designs elements are properly blended have better appeal and stronger purchase intention. Silayoi and Speece (2004), found that visual elements of the package, especially, color and graphics strong influence on users' selection of product. Ares & Deliza (2010), studied the effect of color and shape of the package on purchase intention of milk-based dessert products and suggested that both shape and color affected sensory expectation and liking score of the products. Clement et al., (2013) demonstrated that the shape and contrast of the package have dominant effects on capturing user attention at the store.

Data Collection

Current research employed a quantitative survey-based user study. A total of 126 users of CPG products from various parts of India were recruited for the study. Users were recruited using social media platforms such as Facebook and WhatsApp. The participants were of age group 18-54. 62.7% of the participants were male. Importance of various product, package, and brand-related attributes in purchasing CPG were assessed. Product-related features such as texture, fragrance, quality, efficacy and usage experience were selected. For package related attributes, color, shape, beautiful look, and convenience of usage were selected. Brand related attributes such as brand name, advertisements, country of origin, word of mouth (WOM), and value for money were selected. A five-point Likert scale is employed to assess the importance of each factor. The study was conducted from October to November 2018.

Results & Data Analysis

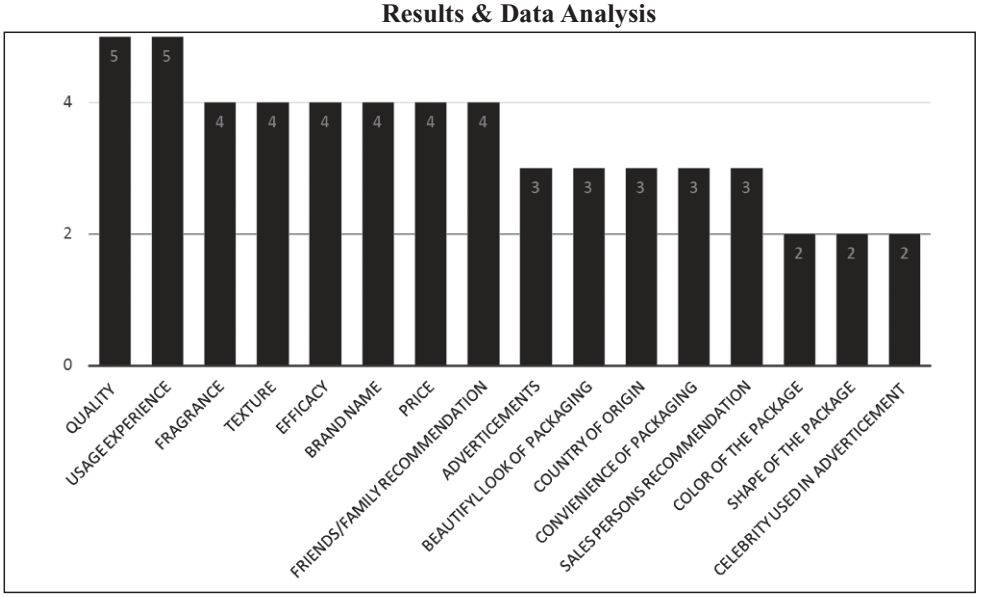

Chart 1: Results from analysis of factors of influencing CPG product purchase of Indian users. Median score from five-point Likert scale testing among 126 Indian users is presented. Higher number represents higher importance for the users.

The median score obtained from the analysis of Likert scale score is presented in chart 1. The median score was used for the analysis because for Likert scale data, 'mean' has a higher chance of distorting the data. While the options on a Likert scale are mathematically equidistant, the emotional distance varies. For example, a person is likely to perceive the distance between 'somewhat important' and 'very important' as greater than that between 'very important' and 'extremely important' on a 5-point scale. Knapp (1990) suggested that a value of 3.5 average is meaningless as it cannot be expressed as agree and a half. Median would be a more accurate measure for the Likert scale as it gives the option that the maximum number of participants favored (Allen & Seaman, 2007). Based on chart 1, product experience related features like quality of the product and usage experience received the highest score among all the attributes. Other product-related attributes like the efficacy of the product, fragrance, and the texture of the product were also received relatively high scores. Among brand-related attributes, brand name, price (value perception) and WOM from family and friends' recommendation received a higher score compared other brand-related attributes like advertisements, celebrity and salespersons recommendation. Although package related attributes came as relatively less important compared to product-related attributes, within the package related attributes, convenience and beautiful look of the package came up as relatively higher importance compared to design elements like shape and color of the package.

In addition to data analysis using Median, statistical analysis using t-test was also performed to understand statistical significance of importance of 'good usage experience' compared brand related and package related attributes. The results are presented in table 1 and 2. From table 1, it can be concluded that the importance of good usage experience is significantly higher than all brand related attributes with a p-value of <0.001. Further, from table 2, the importance of good usage experience is also significantly higher than package related attributes with a p-value of <0.001.

Table 1

	Good Usage Experience	Brand Name	Price	Country of Origin	Family and Friends Reco.	Advt.	Celebrity	Sales Persons' Reco.
Mean	4.28	3.9	3.83	3	3.71	3.06	2.22	2.67
Std. dev	0.81	0.96	0.86	1.19	0.91	0.88	1.01	0.84
P value		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 1: Results from statistical analysis using t-test for comparing importance of 'good usage experience' and various brand related attributes are presented (N=126).

Table 2

	Good Usage Experience	Color of Package	Shape of Package	Beautiful Look of Package	Convenience of Package
Mean	4.28	2.48	2.39	3.13	3.34
Std. dev	0.81	1.02	1	1.01	0.96
P value		<0.001	<0.001	<0.001	<0.001

Table 2: Results from statistical analysis using t-test for comparing importance of 'good usage experience' and various package related attributes are presented (N=126).

In terms of past product purchase experience, about 66.7% of users in the study indicated that they have had bad experiences from their past purchase of CPG products. The result from the analysis of factors that cause purchase dissatisfaction is presented in chart 2. 81% of the users indicated that unpleasant usage experience is one of the top three factors that caused dissatisfaction. High Price (50.8%) and unpleasant fragrance (43.7%) were the second and third. All these factors are related to the product experience. The primary reason for 'Price' of the product causing dissatisfaction is because product experience is failed to meet users' value expectation at product purchase. An unpleasant fragrance is also a product experience related attribute.

The result from analysis of factors that are important for repeat purchase of a CPG product is presented in Chart 3. Good usage experience, value for money, and good fragrance are the top three important factors for the repeat purchase. Repeat purchase is important for establishing a long-lasting user-brand relationship. Over 88% of the users indicated good usage experience as one of the top three important factors in making repeat purchase decision. Based on the study, aesthetic elements such as the beautiful look of the package, color, and shape of the package has the least influence in repeat purchase decision making.

Chart 2:

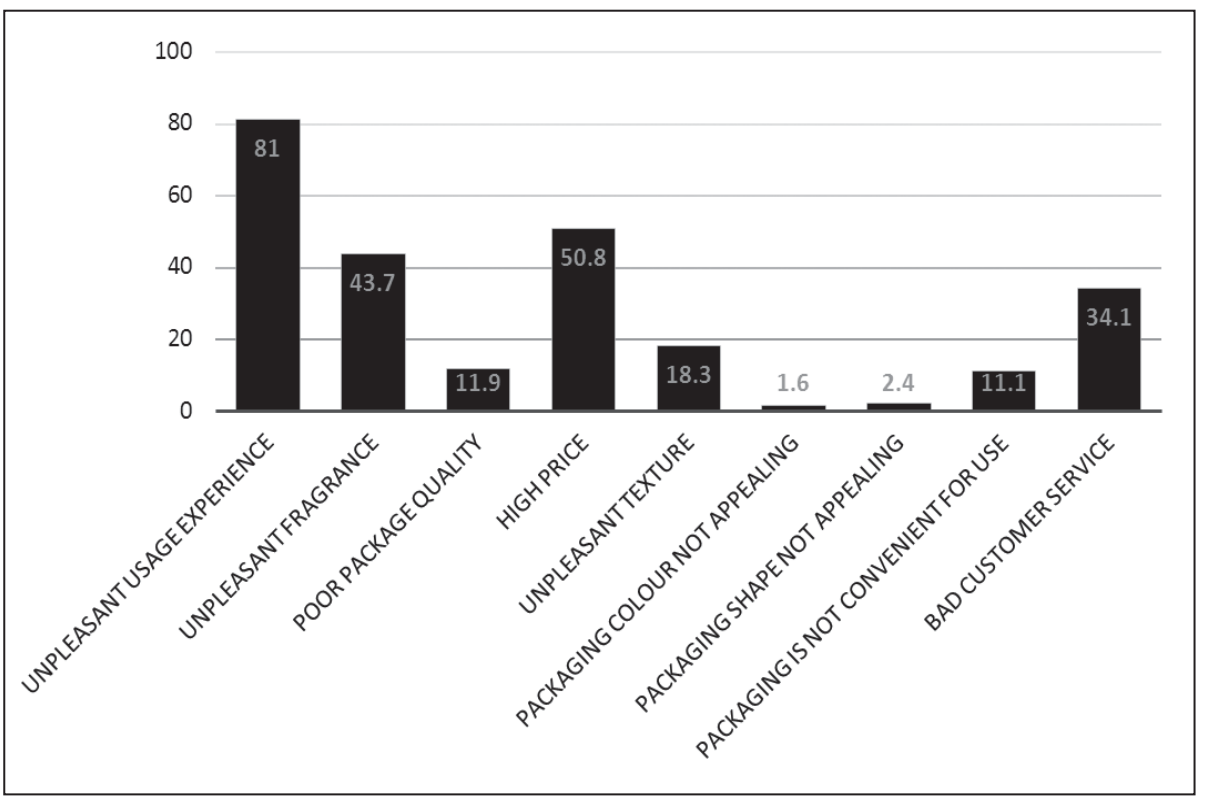

Chart 2: Results from analysis of factors contributing user dissatisfaction after purchasing CPG products. In Y-axis, percentage of users selected the factor as one of the top three factor that cause dissatisfaction is presented (N=126).

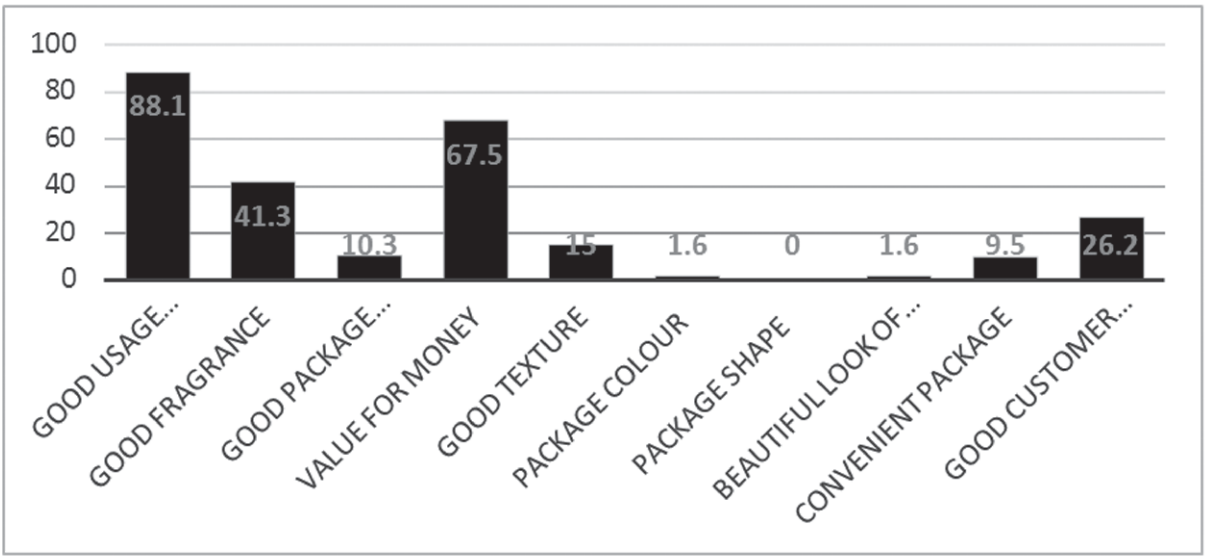

Chart 3: Result from analysis of factors important for repeat purchase of a CPG product. In Y-axis, percentage of users selected the factor as one of the top three factor is presented (N=126).

Summary

Current study provided insights on the importance of various brand, product, and package related attributes on Indian users' CPG product purchase. The study revealed that 'good usage experience' and quality of the product are the two most important factors users expect from CPG products. Further, analysis of factors that contributed to a user being unhappy with a purchase showed that unpleasant usage experience is the single most critical factor causing dissatisfaction, with over 80% of users agreeing to it. Similarly, when the likelihood of repeat purchase is considered, the same factor comes into play again. In general, it can be concluded that user satisfaction and repeat purchase are governed mostly by good user experience. This is consistent with findings from Kempf and Smith (1998). They suggested that product usage experience, especially the first trial is an important factor in influencing user perception about brand beliefs, attitude and purchase intentions (Kempf and Smith, 1998).

Findings from the current study are particularly relevant to marketers who are commercializing CPG products in Indian market. Based on the current study, companies should spend more effort in providing product experience to the users during their decision-making process. Companies could create different types of experiences such as sensory, affective, creative cognitive, physical and social-identity experiences to provide holistic experiences (Schmitt, 1999). This would help companies to drive user satisfaction and repeat product purchases, which are important for establishing long-standing relationships with users. Further, user satisfaction would also help in improving willingness to pay the price premium and create positive word of mouth, which would further drive trial with new users (Gil et al., 2007).

Although factors like advertisements, celebrities, and package related attributes came as relatively less important factors for the user, companies should not be completely ignoring these factors. Advertisements are important in driving brand awareness and thus contributing to trial (Buil et al., 2013). Similarly, package related attributes like shape, color etc. also play their role in brand personality formation and creating an urge to buy at the point of sale (Silayoi & Speece, 2004).

The current study also has certain limitations. The study used online survey-based approach for understanding user behavior. However, studies involving the point of sale user understanding are required to understand actual user behavior and the effect of various factors like time and money pressure in decision making. Further, the scope of the current survey was general in nature and not specifically a product category. Therefore, future researches in understanding the role of various factors in the purchase of specific category of products would be interesting. In addition, future studies to assess the effect of design strategies providing product experience at the point of sale on purchase intention and driving user-brand relationships would be also beneficial for product designers and marketers.

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Measurement Scale Of Tourism Destination competitiveness: Supply Side Perspectives

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Abstract

This study is mainly focused on the development and validation of a measurement scale of Tourism Destination Competitiveness from supply side employing a stakeholder's perspective. The study uses primary data to extract the measurement item. It uses confirmatory factor analysis to identify the appropriate dimensions of tourism destination competitiveness. This study has succeeded in developing and validating an TDC scale consisting of eight dimensions i.e., Natural, Culture and Heritage, Tourism Infrastructure, Range of recreational Activities, Shopping, and Entertainment, General Infrastructure and Hospitality.

Key Words: *Tourism Destination, Competitiveness, Tourism Stakeholders, Tourism Infrastructure, Confirmatory Factor Analysis.*

Competition is not only the driving force behind sustenance of living beings, but for organizations as well. Competition when fair, results in innovation, effectiveness and efficiency leading to quality improvement. With forces like technological revolution and globalization gaining ground, several changes are sweeping the industries and tourism is not an exception to it. One such change relates to the growing competition among destinations to carve out a niche for them. Further, new destinations are also emerging, besides existing ones are innovating themselves. Hence, the landscape of tourism industry has become dynamic. The industry has largely remained resilient to the downturn of world economy. In fact, tourism is one of the most rapidly growing industries and has outshined traditional industries to become one of the world's largest and fastest expanding economic activities (WTTC, 2015). The view that tourism is an export industry is of considerable appeal to regions in search of overall development. For numerous nations across the globe, it accounts for almost entire chunk of their national income. Due to its strong backward and forward linkages, it has emerged as a new driver of development for many countries including India.

With many countries as well as states within India competing to attract tourists, the industry has become highly competitive, both at home and outside. Further, tourists are more experienced and knowledgeable. As a result, the concept of destination has undergone a sea change whereby, modern destinations are expected to instil visitors with a sense of added value (Quinlan, 2008). Destinations therefore, are being forced to build a recognizable brand by constantly upgrading their tourism offerings as well as developing new ones. The concept of destination competitiveness has been generated huge attention among industry persons, policy makers and researchers.

However, gaining and maintaining competitive advantage is a herculean task. Once a destination decides to enhance its competitiveness, it has to seek answers to several important questions before operationalizing the plans and strategies. Some of these questions are: What determines competitiveness of a tourism destination? How to measure the factors determining destination competitiveness? Is there a universal list of indicators that can be applied to analyze its competitiveness? The survey of available literature reveals that answers to these questions are still not satisfactory. As for instance, there are several theories and models of destination competitiveness, but hardly any universal list of destination competitiveness indicators (Gupta, S., & Singh., A, 2015).

This study is mainly focused on the development and validation of a measurement scale of Tourism Destination Competitiveness employing a stakeholder's perspective. The study uses primary data to extract the measurement item. It uses confirmatory factor analysis to identify the appropriate dimensions of tourism competitiveness for Destination Bundelkhand.

Further the structure of the paper is as follows. Section 2 deals with the relevant literature review of the tourism destination competitiveness. Section 3 Presents research Methods and methodology adopted this study. Further section deals with the data analysis and discussion related to measurement scale convergence and discriminate validity. The last section presents the conclusion and implication of the study.

Literature review

Competitiveness is a concept that has been extensively studied in many diverse disciplines such as economics, international business, strategic management and even natural sciences. However, it has been lately introduced to tourism. The reason being that discipline of tourism both as a field of study and research is still evolving, but in recent decades has attracted a lot of attention. However; in India the researches in this field are scanty (Gupta, S., & Singh., A, 2015). This section presents a succinct view of some theoretical and empirical studies concerned with destination competitiveness.

Destinations are a quite complex offering consisting of numerous products and services, and therefore, analyzing its competitiveness is a ticklish task. While there are models of destination competitiveness that have applied the concept of competitiveness to tourism, they are far from capturing all the dynamics and intricacies associated with destination competitiveness measurement. Furthermore, the influences on competitiveness can change quickly. This dynamic nature creates further challenges and a need for on-going research and development on indicators of competitiveness (OECD, 2013)

The concept of destination competitiveness has been applied in the field of tourism as a separate discipline while the roots of literature on competitiveness related to international economics. Originally, the term competitiveness was used to describe the relative strength of nations in international trade. Traditionally, the notion of competitiveness has been adapted from economic theory and further applied to the general firm or country (Margarida Abreu-Novais et. al.,

2015; WEF, 1995; Bordas, 1994; Porter, 1990). Hence, the theory of destination competitiveness should be consistent with the notion of 'competitiveness' in economics and international business literature.

Competitiveness "represents the fundamental external validation of a firm's ability to survive, compete and grow in markets subject to international competition" (Bristow, 2005). In commensurate to this, a critical review of literature related to the competitiveness of firm, country, and tourism destination was undertaken to develop a suitable framework. Like development, competitiveness is a complex interactive process of changes occurring in different spheres such as social, political, economic etc. Hence, there can be no universal theory of competitiveness. Rather, various explanations have been offered from different disciplines. The literature survey reveals a striking variation in perspectives in conceptualizing, understanding, and measuring competitiveness.

Though there is plethora of perspectives on competitiveness, grounded in several disciplines, they all can be categorized into three classes. First, comparative advantage and/or price competitiveness perspective (Corigliano & Mottironi, 2012; Crouch & Ritchie, 2005; Enright & Newton, 2004; Uysal, Chen, & Williams, 2000; Bellak, 1993; Cartwright, 1993; Hodgetts, 1993; Rugman, 1991; Porter, 1990). Second, a strategy and management perspective (Casanueva et al., 2014; Amankwah-Amoah & Debrah, 2011; Gooroochurn & Sugiyarto, 2005; D'Cruz & Rugman, 1993; Mahmoud et al., 1992; Mahoney & Pandian, 1992) Third, a historical and socio-cultural perspective (de Bloom, Geurts, & Kompier, 2012; Nawijn & Mitas, 2012; UysalPerdue, & Sirgy, 2012; Andereck & Nyaupane, 2011).

Thus, it is an extremely complex concept for a host of factors account for it. Competitiveness has two important characteristics. First, it is a relative concept i.e. compared to what. Second, it is multi-dimensional i.e. what are the features of competitiveness? (Dwyer & Kim, 2003; Spence & Hazard, 1988). This is the reason why competitiveness has been defined differently by different authors.

Extending the original idea of competitiveness to tourism literature, the competitiveness of a tourism destination too is a complex and relative concept, depending upon the conceptualization of destination (Kotler, Bowen, & Markens, 2006). Dynamic complexity of destination competitiveness is perceived as a means to ensuring prosperity for individual stakeholders and society at large (Ernest Azzopardi& Robert Nash, 2015).

The concept of tourism destination competitiveness has evolved over the years. Initially the concept of destination competitiveness focused on tourism attractiveness, but has now moved to strategic development of the tourism industry. It is now a holistic concept encompassing different aspects of competitiveness. Competition among tourism destinations is usually not limited to individual aspects of the tourist product like natural attractions, transportation, hospitality, etc., but on the integrated and compound set of tourist facilities for the client (Buhalis, 2000; Ritchie & Crouch, 2000).

Barney (1991) considers tourism destinations as a set of specific physical, natural, cultural and human resources, which are rare, inimitable, and non-substitutable and can generate capabilities which become useful to create and develop competitive advantage.

The ability of any destination to attract and satisfy visitors is an important indicator of its competitiveness. Also, this competitiveness is determined not only by tourism related factors, but by a whole range of factors having direct and indirect relation with the destination.As per D'Hauteserre's (2000) "destination competitiveness is the ability of a destination to maintain its market position and improve upon it through time."

There are definitions of destination competitiveness which approach the concept from sustainability or social perspective. For instance, Hassan (2000) defines "destination competitiveness as the ability of a destination to create and integrate value - added products that sustain its resources, while maintaining market position relative to its major competitors."

Nevertheless, the definition given by the Organization for Economic Cooperation and Development (OECD) appears to be comprehensive: 'Tourism competitiveness for a destination is about the ability of the place to optimize its attractiveness for residents and non-residents, to deliver quality, innovative, and attractive (e.g. providing good value for money) tourism services to consumers and to gain market shares on the domestic and global market places, while ensuring that the available resources supporting tourism are used efficiently and in a sustainable way' (OECD, 2014).

With regard to social benefits, the ability of destinations to provide a high standard of living for its residents is called destination competitiveness (Crouch & Ritchie, 1999). Unless a destination provides superior tourism product over its competitors, it cannot be called competitive (Dimoska &

Trimcev, 2012). Destination competitiveness can be connected to its ability to deliver an experience that is more satisfying compared to other destinations (Vengesay, 2013).

After a comprehensive and careful scrutiny of destination competitiveness literature, we observed that destination competitiveness has emerged as a main topic in tourism research, and in the recent literature the analysis and measurement of Tourist Destination Competitiveness has attracted increasing interest (Cvelbar, L. K et.al, 2015; Crouch, 2011; Ruhanen, 2007; Enright & Newton, 2004; Kozak, 2002; Alavi & Yasin, 2000; Ritchie & Crouch, 2000). Since the 1990s, tourism researchers have developed an elegant theoretical and conceptual framework explaining how a tourism destination manages its competitiveness. The major contributors include Dwyer et al, 2014; Vengesay, 2013; Blanke & Chiesa, 2013; Crouch, 2011; Ritchie & Crouch, 2003; Heath 2003; Dwyer & Kim 2003; Hassan 2000; and Poon 1993. They provide a general understanding of Tourism Destination Competitiveness and also suggest its determinants that affect how a destination achieves and enhances its competitiveness over its competitors.

Methodology

Sampling Procedure

Primary aim of the study was to develop and validate a measurement scale of tourism destination competitiveness. The study being empirical in nature, made use of primary data to achieve the required objectives of the research. Purposive sampling methods was performed to collect the data from the respondents. A total 460 questionnaires were distributed to the different areas of the Bundelkhand. Out of 460, 445 questionnaires were returned from the respondents. After reviewing the received questionnaires 15 questionnaires were not appropriately filled up by respondents. So, finally 430 questionnaires were usable for analysis purpose. Special care was taken to include all major stakeholders of tourism industry from Bundelkhand region of India. For this purpose, all the stakeholders were divided into four categories namely, international tourists, domestic tourists, local residents, and tourism experts. Next to it, the quota of each stakeholder was decided. The quota allocation decision was based on following guidelines:

- Tourists should constitute at least half of the total sample, with ratio of domestic to international tourists being fixed at 2:1.
- Local residents should constitute about one fourth of the total sample.
- The tourism experts' quota was fixed between 10-15%.

Various categories of Stakeholders are mentioned in table 1 given below.

Table 1: Distribution of Respondents

Serial No.	Stakeholders Segment	Size
1	International Tourists	82
2	Domestic Tourists	177
3	Local Residents	116
4	Tourism Experts	55
	Total	**430**
Source: *Researcher's calculation based on survey data*		

Measurement Scale

Competitiveness of tourism destination has gained increasing scholarly attention in the travel and tourism field. Several studies have examined the determinants of destination competitiveness (Enright & Newton, 2005, 2004; Dwyer et al., 2004; Hudson, Ritchie, & Timur, 2004). Extensive literature review was done to design the survey instrument for collection of primary data. Survey instrument was divided into two segments. Demographic characteristics namely nationality/state, gender, age, education level, marital status, household income and occupation etc. were included in first segment of the instrument. The second segment included questions on respondent's perception on destination competitiveness based on their general vacation experience. Eight key constructs for destination attractiveness and competitiveness were identified from in-depth survey of literature. Key Constructs are as follows: Natural, Culture and Heritage, Tourism Infrastructure, Range of recreational Activities,

Shopping, and Entertainment, General Infrastructure and Hospitality. The summated rating method, with a 5-point Likert scale (ranging from 1= not at all attractive, 5= highly attractive) was used for the measurement of perceived tourism competitiveness, 5 point Likert scale (ranging from 1= Not at all attractive, 5= Highly attractive) was used for destination competitiveness items.

Data analysis procedures

Analysis of the collected data adopted a positivist approach, using appropriate quantitative techniques. SPSS and AMOS version 22 was used for analysis purpose. Socio-demographic profiles of respondents were analyzed using frequency distribution. Reliability of the construct was checked by applying Cronbach's alpha. Further Confirmatory factor analysis was used to identify the appropriate dimensions of tourism competitiveness. Further we evaluated the properties of measurement scales for convergent and discriminant validity and construct composite reliability.

Pilot Test and Reliability of measurement instrument

The content validity of the instrument was checked through screening exercises (Sekaran, 2003). The questionnaire was finalized after it was proofread by four professors of management, economics and Tourism, including the researchers supervisor, and 1 tour operator, 1 hotel manager and 1 government tourism officer from Bundelkhand region. It was pretested, and on the basis of the debriefing of the pretest respondents, minor changes were made to improve the clarity and visual layout of the questionnaire.

The reliability of the measurement scale was checked in order to meet the reliability of the survey instrument at pilot study. Cronbach's alpha value of all the measurement constructs was .747, which exceeds the conventional benchmark of 0.70 Hair et al., 2006, and Byrne, 2010).

Results and Discussion

General Sample Descriptions of Tourism Stakeholders

The demographic characteristics of tourism stakeholders in this study were measured by gender, age, education, marital status, profession, and family income. The summary of demographic characteristics of respondents is reported in table 2.

Table 2: Demographic Characteristics of Tourism Stakeholders

Variables	Frequency N=430	Percent (%)
Gender		
Male	244	56.7
Female	186	43.3
Age		
Up to 20	22	5.1
21 to 40	297	69.1
41 to 60	83	19.3
61 and Above	28	6.5
Education Level		
Up to 12^{th}	49	11.4
Graduate	208	48.4
PG and Above	173	40.2
Marital Status		
Married	215	50.0
Unmarried	198	46.0
Widowed/Widower	12	2.8
Divorced	5	1.2
Profession		
Retired	15	3.5
Self Employed	78	18.1
Government Employee	72	16.7
Student	88	20.5
Employed in Private Sectors	165	38.4
Other	12	2.8
Annual Income of the Family		
Up to 1,00,000	78	18.1
1,00,001 to 3,00,000	111	25.8
3,00,001 to 5,00,000	98	22.8
5,00,001 and Above	143	33.3
Sources: *Researcher's calculation based on survey data*		

The respondents comprised males (56.7%) and the rest 43.3% were females. The results showed that 69.10 % of respondents were aged between 21 to 40 years, followed by age ranges of 41-60 (19.30%), then 61 and above (6.50 %), and 15 to 20 (5.10%). Accordingly, the results indicated that the majority of respondents (88.40%) were aged between 21 to 60 years. One of the important socio-demographic variables used in this study was the educational level of the stakeholders, which has impact on various travel related variables. Education levels of tourism stakeholders showed that 48.40% of respondents held graduate degrees, 11.50% had education up to secondary level (12th), while 40.20% held postgraduate and higher degrees.

Tourism is much affected by the marital status of individuals as the needs of tourists differ according to their marital status. As for instance, unmarried tourists prefer all their time to be filled with activities, whereas tourists who are married with families prefer to stay in places which are tranquil and comfortable. They want entertainment to be provided at the place of stay. From a marital status perspective, 50.0% of respondents were married, and 46.0% were single. There were very few (4.0%) respondents in widowed and divorced category. Hence, the sample was adequately represented by both married and singles tourists. In terms of respondent's profession, it was found that the majority of respondents, 38.40% were employed by private sector organisations and 18.10% were self employed.

Results of Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) is essential to test the relationships between the observed items and the construct they measure. Further, we have performed the Confirmatory Factor Analysis (CFA) to create a measurement model. Upon determining the measurement model, it is possible to evaluate directly the measurement efficiency. According to Bentler (1990), the confirmatory factor analysis technique (CFA) provides the fullest indication of measurement efficacy. Thus, the specific CFA techniques (construct reliability, convergent validity and discriminant validity) were applied in this study by using Amos 21.0 software with maximum likelihood estimation procedure (MLE).

The measurement scale for tourism competitiveness contained 34 observed items. All the 34 items were treated as eight factors. These were Natural Resources (4 items), Cultural & Heritage Resources (5 items), Tourism Infrastructure (5 items), Range of Recreational Activity (3 items), Shopping (3 items), Entertainment (2 items), General Infrastructure (7 observed items), and Hospitality (5 observed items). They were all entered into the CFA analysis process utilising the Maximum Likelihood procedure.

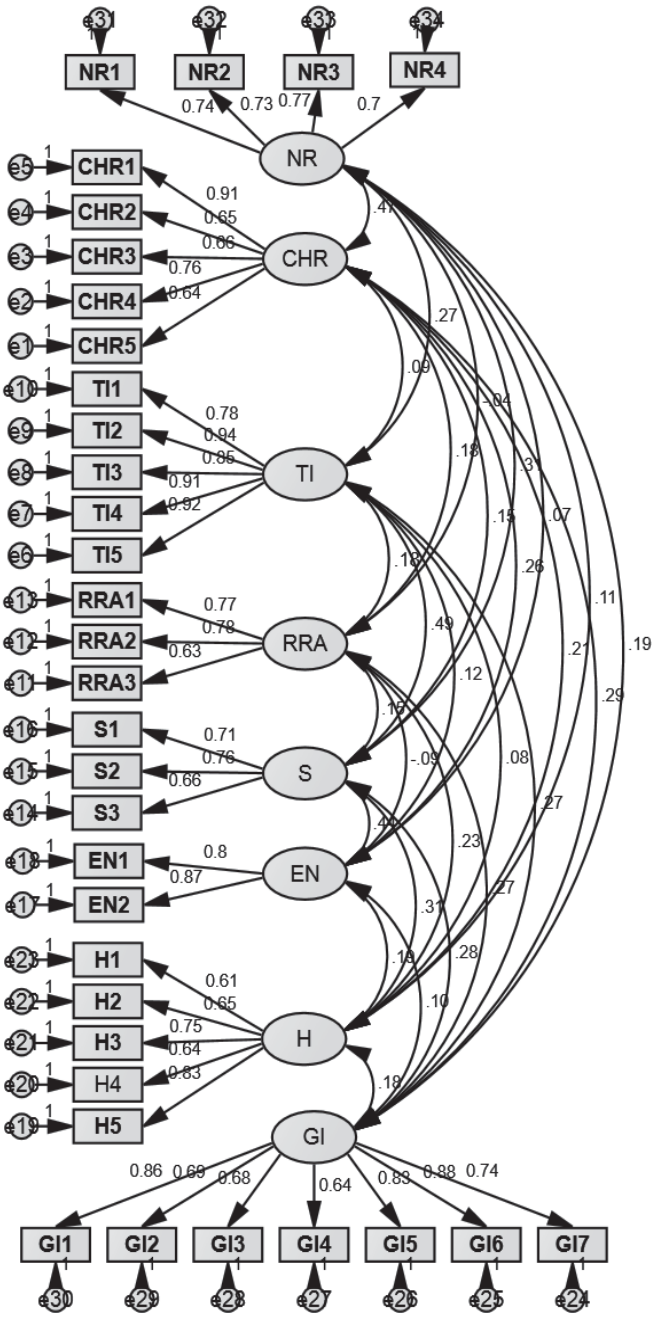

Figure 1: Standardised CFA for Eight-Factor Tourism Competitiveness

[Note: For full items (indicators) names with mean and Standard deviation see Appendix 1]

Table 3: Convergent validity of the constructs

Constructs	Items	Estimate	Stander error	CR	AVE
Natural Resources	NR1	0.74	0.452	**0.825**	**0.541**
	NR2	0.73	0.467		
	NR3	0.77	0.407		
	NR4	0.7	0.510		
Cultural & Heritage Resources	CHR1	0.91	0.172	**0.849**	**0.535**
	CHR2	0.65	0.578		
	CHR3	0.66	0.564		
	CHR4	0.76	0.422		
	CHR5	0.64	0.590		
Tourism Infrastructure	TI1	0.78	0.392	**0.946**	**0.778**
	TI2	0.94	0.116		
	TI3	0.85	0.278		
	TI4	0.91	0.172		
	TI5	0.92	0.154		
Range of Recreational Activities	RRA1	0.77	0.407	**0.772**	**0.533**
	RRA2	0.78	0.392		
	RRA3	0.63	0.603		
Shopping	S1	0.71	0.496	**0.754**	**0.506**
	S2	0.76	0.422		
	S3	0.66	0.564		
Entertainment	E1	0.8	0.360	**0.822**	**0.698**
	E2	0.87	0.243		
Hospitality	H1	0.61	0.628	**0.826**	**0.500**
	H2	0.65	0.578		
	H3	0.75	0.438		
	H4	0.64	0.590		
	H5	0.83	0.311		
General Infrastructure	GI1	0.86	0.260	**0.907**	**0.586**
	GI2	0.69	0.524		
	GI3	0.68	0.538		
	GI4	0.64	0.590		
	GI5	0.83	0.311		
	GI6	0.88	0.226		
	GI7	0.74	0.452		

Sources: *Researcher's calculation based on survey data*

Overall, the model produced quite satisfactory results, having a Chi-square value of 296.561 with 106 degrees of freedom (p = 0.000) and CMIN/DF= 2.268, which is in the 0-5 range (Bentler, 1989; Shumacker & Lomax, 2004; Chiu et al., 2006). Two measures that could be broadly described as based on the population discrepancy include, the Root Mean Square Residual (RMR) and the RMSEA. In both the cases, when the model fits the sample ideally, these measures give values of 0 for the discrepancy, with 0.08 as an acceptable threshold value. The RMR (0.064) an RMSEA value of 0.064falls within the acceptable range of the measurement Moel. Additionally, the value of the Standardized Root Mean Square Residual (SRMR) value was 0.037 which was lower than the cut off value (0.05), as recommended by Hair et al. (2006), and Byrne (2010), which indicated a good model fit.

Two other measures that estimate goodness-of-fit include, the goodness of fit index (GFI) and the adjusted GFI (AGFI). The GFI is the measure of the relative amount of variances and co-variances in S that are accounted for by the implied model (Jöreskog & Sörbom, 1992). The adjusted GFI takes into account the number of degrees of fit involved. It ranges between 0 to 1, with the latter indicating a perfect fit. However, a value of 0.90 is considered acceptable. In any case the GFI (0.921) an AGFI (0.908) value achieve the acceptance level.

Moreover, regarding the incremental fit measures which assess how well the model fits relative to the null model, CFI, and NFI of the final models were 0.936, and 0.975 respectively, which exceeded the cut-off value of 0.9, as recommended by Bentler (1990), Hair et al. (2006), Chow & Chan (2008) and Yang et al. (2008).

Testing the Validity of the Measurement Scale of Tourism Competitiveness

The second aim of employing CFA in the current study was to test the factor loadings of each observed variable on the latent variable. This permits for the assessment of the constructs in terms of Convergent validity and Discriminant validity (Hair et al., 2006, Kline, 2011).

In measurement model, convergent validity demonstrates whether items underlying a specific construct are convergent and share a high proposition of variance in common (Hair et al., 2010). In order to establish convergent validity, we examined the parameters such as factor loading of the item, average variance extracted (AVE), and composite reliability (CR) (Hair et al., 2010). The first criteria of Convergent validity of the overall measurement model were factor loadings of item. It should be greater than 0.5 or higher. Average variance extracted (AVE) is a primary indicator of convergence and if the value of AVE is less than 0.5 indicates that more error is still remain in the model than the variance explained by latent variable (Hair et al., 2010). On the other hand, construct reliability (CR) value in the model 0.6 and above indicates the adequate internal consistency of the latent construct analyzed. Further, the composite reliability and Average Variance Extracted (AVE) and are shown in the table 3 already given.

The composite reliability of eight factor measurement construct was confirmed as its values for natural resources were 0.825 and cultural & heritage resources was 0.849, Tourism Infrastructure was 0.946, Range of Recreation Activities was 0.772, Shopping was 0.754 and Entertainment was 0.822 General Infrastructure was 0.907 and of Hospitality was 0.826, which exceeded the recommended threshold level of 0.70 (Hair et al., 1998).

As another measure of reliability, the variance extracted measure was also calculated. This measure represents the overall amount of variance in the indicators accounted for by the latent construct. The value should exceed a threshold guideline level of 0.50 for the construct (Hair et al., 1998). In this study, the extracted variance for all the eight measurement constructs revealed a value of 0.541 (NR) and 0.535 (CHR), .778 (TI), .533 (RRA), .506 (S), .698 (EN), .586 (GI), and .500 (H) which exceeded the recommended level of 0.50. Overall, the eight constructs retained 35 observed indicators with satisfactory results of fit indices. To conclude, the measurement items that were related to all the eight constructs were relatively important indicators to measure Tourism Competitiveness of Bundelkhand.

Further discriminant validity can be described as the extent to which two theoretically similar concepts are different (Churchill, 1979; Hair et al., 2010). Discriminant validity, assessed by comparing the construct correlations with the square root of the average variance extracted (Fornell and Larcker, 1981), was also examined. The results in Table 4 indicate that the square root of the average variance extracted for each construct was greater than the levels of the correlations involving the construct, thus confirming the discriminant validity.

Table 4: Discriminant Validity of the Construct

Construct	AVE	NR	CHR	TI	RRA	S	EN	H	GI
NR	0.541	0.735							
CHR	0.535	.190**	0.731						
TI	0.778	.223**	.572**	0.882					
RRA	0.533	.321**	.355**	.126**	0.730				
S	0.506	.387**	.521**	.456**	.308**	0.711			
EN	0.698	.478**	.489**	.355**	.630**	.411**	0.836		
H	0.500	.427**	.390**	.399**	.467**	.529**	.216**	0.701	
GI	0.586	.656**	.612**	.467**	.511**	.521**	.479**	.426**	0.765

Note. Square root of average variance extracted (VE) is shown on the diagonal of the matrix.
**Correlation is significant at the 0.01 level (2-tailed)
Sources: *Researcher's calculation based on survey data*

More specifically, in assessing discriminant validity of eight factor measurement construct, the square root of the AVE of NR was 0.735, CHR was 0.731, TI was .882, RRA was .730, S was .711, EN was .836, GI was .765 and H was .701 which was greater than the squared correlation matrix value between all the eight constructs.

Implication and Conclusion

The present study attempts to develop a scale to measure the competitiveness of tourism destination. Following the procedure set by Churchill (1979) and Hinkins (1995) for scale development, the present study succeeded in developing and validating an TDC scale consisting of eight dimensions i.e., Natural, Culture and Heritage, Tourism Infrastructure, Range of recreational Activities, Shopping, and Entertainment, General Infrastructure and Hospitality. A major contribution of this study is the establishment of a measurement construct, namely, TDC of Indian context, which empirically examines the factor which determines the destination competitiveness of a destination. Findings show that all dimensions are successfully grouped under TDC.

This result implies that competitiveness of tourism destination determines many tourism and non-tourism related and dimensions. The tourist choice of a destination largely depends on the attractiveness and competitiveness of the destination. Like in India inherited resource such as natural resources and cultural and heritage resource are the core attraction for the domestic as well as the foreign tourists. These resources are the main motivators which arouse the feeling in the mind of tourist to visit different part of India.

Furthermore, the findings not only fill the gaps of previous studies on tourism destination competitiveness, but also provide recommendations of DMOs for the enhancement and leveraging the tourism competitiveness of a destination. From a managerial perspective, this study presents a direction for gaining competitive advantage by attracting tourists to a tourism destination through the attractiveness and competitiveness. Many destinations expend efforts to attract tourists because of the potential economic effect that these tourists bring (Santos & Cabral, 2014). Therefore, the competition among tourism destinations is becoming fiercer.

This study assumes that TDC plays an important role in the visiting intention of tourists. It contributes to DMOs by identifying the key dimensions of tourism destination competitiveness. By reducing the complexity of tourist behavior in uncertain situations, resource attractiveness and competitiveness has become the most important factor in the visit intention and post purchase behavioral intention.

Despite the efforts to conduct a sound research, this study has several limitations that should be acknowledged. Several suggestions for future research are also proposed. The first limitation is related to the convenience sampling method adopted in the study.

The respondents were approached on the basis of their availability and/or accessibility. Although the convenience sampling method is the most feasible approach for an on-site tourist survey, this technique has been criticized for its bias. As for the limitations of this study and directions for further work, the criterion-related validity of the scale developed should be further examined by conducting more surveys on a larger scale within the stakeholder.

Future work should consider the applicability of the scale across different tourism destination of India as well as countries. In fact, the increasing use of social media and the awareness of tourim provides a compelling reason for

exploring the influence of attractiveness and competitiveness of a destination on tourist visit behavior.

Future research must validate the dimensional structure of tourism competitiveness across different developing tourism destination that has a great potential but still remains unexplored.

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Identifying Enablers of Social Entrepreneurship: Interpretive Structural Modelling

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Abstract

The present study, "Identifying Enablers of Social Entrepreneurship: Interpretive Structural Modelling," aims at identifying and prioritizing enablers of social entrepreneurship using interpretive structural modeling(ISM). It further examines the interrelationship among facilitators of social entrepreneurship and categorizes them into four categories based on driving and dependence power. Government policies, university and financial bodies's support, family exposure and autonomy are the most important enablers of social entrepreneurship. The results of the study would help policymakers to frame policies to promote social entrepreneurship.

Keywords: Social Entrepreneurship, structural modeling, Structural self interaction matrix, Reachability matrix.

India has numerous social challenges in the field of education, healthcare, agriculture, renewable energy, manufacturing, and skills development. Over 60% of the Indian population still live on less than $2 (about Rs.130 at current rates) a day. The government efforts to address these issues have been inadequate so far. Due to this, in many countries, the role of the government in the socioeconomic sphere is shifting towards privatization of public responsibilities. Social entrepreneurship in India has progressed rapidly over the last decade. According to (British Council Report, 2016), around two million social enterprises are working in India to serve people. More people are using their entrepreneurial skills to build sustainable enterprises for profit and nonprofit to bring change in India. India offers countless opportunities to the social entrepreneur and other social stakeholders. The massive number of people, low cost of establishing a company, the vibrant social enterprise ecosystem and India's challenges with poverty are the main reasons for the rise of social entrepreneurs in India.

Social entrepreneurship is a growing phenomenon in emerging economies as they are battling a large number of social issues like lack of healthcare facilities, increasing pollution and wastage, lack of education and infrastructure, sanitation, poverty, etc. The social entrepreneurs build innovative business models integrated with social causes to address the sustainability need of our planet. Social entreprenuers defined as the harbinger of new ways of doing business. They employ innovative, cost-efficient and often technology-enabled business models that provide necessary services to those who lack access. Social entrepreneurs focus on social services, employment and training, environment, education, and community development. As a result, an increasing number of social enterprises results in a widespread gain for public budgets. Social entrepreneurs have always been a vital stakeholder segment to engage in delivering essential services and opportunities efficiently and effectively to the underserved in India.

India has been pioneer of social entrepreneurship and is a home of eminent social entrepreneurs like Mahatma Gandhi (father of nation), Dr. Verghese Kurien (father of the Milk Revolution in India), Sanjit Bunker Roy (founder of Barefoot College), and Dr. G. Venkataswamy (founder of Aravind Eye Hospital) amongst many, devoted to spark change in the society through their social initiatives.

India has made great strides in economic growth, but no country can maintain healthy gross domestic product (GDP) growth without addressing inequality among its citizens. The growth of a state requires collective efforts by government and entrepreneurs. Social entrepreneurs can play a crucial role in growth and development by addressing critical issues faced by the country. They can also contribute towards providing employment opportunities to the vulnerable section of the society through sustainable business solutions.

Inadequate government efforts and inefficient social institution demands the need for social entrepreneurship in India. Social entrepreneurship can contribute in economic growth and development by leveraging the opportunities existing in social arena in India. New business models and social innovations can work towards solution of these problems. Realization of the importance of social entreprenuership for developing economies, this paper attempts to identify the key enablers of social entrepreneurship and prioritize them using interpretive structural modeling (ISM). This paper is planned in eight sections. The first section gives introduction about social entrepreneurship. The second section highlights literature review on social entrepreneurship. Research methodology and data analysis are done in third, fourth and fifth section. Results are discussed in sixth sections. Research implications and limitations with future scope are given in seven and eighth sections respectively.

Literature Review

Family Exposure

Family exposure plays a vital role in shaping the entrepreneurial intention of young people. The literature on family entrepreneurial exposure has grown substantially in recent years. Many studies have confirmed the prominence of entrepreneurial disclosure on young people and their willingness to take up entrepreneurial activities in the future (Dunn and Holtz-Eakin, 2000; Fairlie and Robb, 2007). The presence of a parental role model at home works as the added advantage of guidance and provide easy access to their parents business ties (Kim et al., 2006). Further, family exposure enhances self-efficacy and overcome the fear of failure among young people (Bosma et al., 2012). The family support and exposure also plays a crucial role in deciding the career preference of young people (Whiston and Keller, 2004).

Emotional Intelligence

Emotional intelligence is the skills of a person to use sensitive information to shape one's behavior (Salovey and

Mayer, 1990). The presence of emotional intelligence enhances the person's abilities to accurately recognize ones and others emotions which in turn, lead to effective management of emotions for better use (Grewal, Brackett and Salovey, 2006). Understanding of feelings improves leadership skills which help entrepreneurs to inspire their employees to be more creative and innovative in the organization (Modassir and T.Singh, 2008). Emotional intelligence enhances the social effects which are regarded as the essential ingredient of entrepreneurship (Khatoon, 2014). Entrepreneurs face many challenges during their business journey posed by the internal and external environment. Therefore, the biggest problem for any entrepreneur is to exercise control over his/her emotions and feelings (Boren, 2010; Thorndike, 1920). The absence of this trait can become the prime reason for any business failure (Shepherd, 2004). Moreover, recent development in the emotional intelligence field has shown the positive relation of EI with creativity, proactivity, and attitude (Zampetakis et al., 2009) which further influences the entrepreneurial intention of an individual.

Education

The lack of customized entrepreneurial education has been a great challenge for young prospective entrepreneurs in developing economies (Lee et al., 2005). Knowledge which is prominent sociocultural factor affects social entrepreneurial intentions (Ernst, 2011). Felicitous education is the primary determinant of entrepreneurial intention in less developed economies like India (Griffiths et al., 2009). A similar notion can be traced in developed economies too where the direct influence of entrepreneurial education influences the intention of an individual (Romero, 2015). Still, the incongruity between formal and informal entrepreneurial education's impact cannot overrule (Collins et al., 2004; Syahrina et al., 2013; Zainal Abidin et al., 2011).

Support from financial bodies & Universities

Entrepreneurship needs the active support of financial bodies and universities to flourish. The support offered by universities and financial institutions lay the foundation for the molding entrepreneurial behavior of an individual (Dohse and Walter, 2012). The quality training programs given by universities shape the growth of entrepreneurial intention of young minds (Peterman and Kennedy, 2003; Frankeand Lüthje, 2004; Schwarz et al., 2009, Fayolle and Gailly, 2015; Saeed et al., 2015; Piperopoulos and Dimov, 2015; Karimi et al., 2016). Along with support from universities, capital is equally important for any business. It works as oxygen for a business. Lack of capital can prove to be the biggest hurdle in the growth of entrepreneurship (Henderson and Robertson, 2000; Robertson et al., 2003; Li, 2007). Presence of a robust institutional structure is capable of driving more potential entrepreneurs (Veciana et al., 2005).

Self-efficacy

Every economy looks for creative solutions to their problems. Young potential confident entrepreneurs with strong belief system can bring out the desired change in the society with their entrepreneurial behavior (Zhao, Seibert, and Hills, 2005) and pro-social behavior (Giles, McClenahan, Cairn and Mallet, 2004). Self- efficacy is a significant determinant of entrepreneurial intentions (Aslam and Hasnu, 2016; Pihie and Bagheri, 2013; Utami, 2017; Wajeeh Elali Badriah Al-Yacoub, 2016). The social entrepreneurial purpose frames when a potential entrepreneur has an unshakable belief and confidence in his abilities(Mair and Noboa, 2006; Smith and Woodworth, 2012).Prior studies show that self-efficacy act as intermediary with other variables like personality, risk-taking, experience, lifestyle, etc.(Prabhu et al.,2012) influencing entrepreneurial intentions. Therefore, students with high self–efficacy are more likely to become entrepreneurs (Krueger et al., 2000; Zhao et al., 2005; Peterman and Kennedy, 2003; Pruett et al., 2009; Lee et al., 2011; Markman et al., 2002).

Government policies

Developing nations have to embed entrepreneurial thinking at the policy-making level (Haque et al. 2013). Structural support offered by state-owned regulatory institutions (Scott, 2001) further enlighten the entrepreneurial intention of young potential entrepreneurs (Bruton, Ahlstrom, and Li 2010). The study by Shane and Venkataraman (2000) shows that an individual cannot work in isolation and is dependent on prevailing economic environment (Franke and Lüthje, 2003; Turker and Selcuk, 2009; Virick et al., 2015). However, the lack of formal institutional support hinders the business formulation process (Krueger and Brazeal, 1994). Although in few studies no direct relation is conceived between entrepreneurial intention and prevailing economic conditions (Schwarz et al., 2009).

Involvement in social projects

Generally, it observed that people working as social workers are more likely to become successful social entrepreneurs in the future. People involved in social projects are motivated

enough to start their venture (Denhardt and Aristigueta; 2009). According to Lewis and Packard, (2012) participation of people in the social mission of the organization eventually, end up doing their own business. For them, it is their civic duty to serve society. Social entrepreneurial motivation formed by active participation in social responsibilities and projects (London, 2010).

Empathy

The feeling of compassion is rare to find in this cut-throat competitive era. Empathy means compassion (Goetz, Keltner and Simon-Thomas, 2010) and a tendency to feel for others (Preston et al., 2007). It is the natural factor which influences the social entrepreneurial intentions of an individual (London, 2010; Dees, 2012; Groch, Gerdes, Segal and Groch, 2012; Miller, Grimes, McMullen and Vogus, 2012; Wood, 2012). Young potential entrepreneurs should harbor feelings of the emotional response of compassion and concern after looking at societal problems like poverty, unemployment, etc. (Niezink, Siero, Dijkstra, Buunk, and Barelds, 2012). Therefore, empathy is one of the significant predictors of social entrepreneurial intention.

Entrepreneurial opportunities

The literature on entrepreneurial opportunities is less (Dimov, 2007; Hill and Birkinshaw, 2010) and this phenomenon is not fully explored yet (Vogel, 2017). Entrepreneurial opportunities are idiosyncratic (Alvarez and Barney, 2007) and impracticable to measure (Dimov, 2011; Davidsson, 2015). But its importance in becoming a successful entrepreneur cannot be overlooked. The significance of studying sources of entrepreneurial opportunities, discovering process, exploiting opportunities and focussing on people who eventually utilize them is highlighted in the work of Shane and Venkatraman, 2000. Opportunity recognition power is present in the behavior of an entrepreneur (Shane, 2003). However, entrepreneurial opportunities and motives are the backbone of entrepreneurial behavior, (McMullen and Shepherd, 2006) and prerequisite for entrepreneurial intention (Douglas 2013).

Autonomy

Freedom is what everybody looks for, especially generation Y. Students favoring autonomy are likely to opt for entrepreneurial activities in the future (Douglas and Shepherd,2002). The entrepreneurial intention in young potential entrepreneurs is affected mostly by the desirous level of autonomy, leadership, and risk, etc. that they perceive for themselves (Raijman, 2001; Schwarz et al., 2009). Few studies reveal the substantial relation between autonomy and entrepreneurial intentions (Autio et al.,2001).In a couple of reviews, it highlighted that the spirit of independence and self-reliance had uplifted by the university training programs and education provided to potential entrepreneurs (Kwong andThompson,2016). Hence, it would be rightful to say quest for autonomy should never be curbed, especially in case of generation Y.

Creativity

Novelty and appropriateness are synonymous of creativity (Sternberg, 1999) which is immeasurable. Study of Sternberg and Lubart (1999) reveal that entrepreneurship is a form of creativity. Instead, creativity is a foundation of entrepreneurship. Breakthrough studies conducted by Lee et al., (2001) highlight the role of creativity in innovative practices exercised by entrepreneurs. Creativity is a fundamental and critical resource which is must for any potential entrepreneur.

Social capital

The ability of a person to mobilize resources using his social affiliations is known as social capital. It is generally defined as societal resources that connect citizens and enable them to chase their objectives more effectively (Stolle, 2003). Social capital is synonymous with social relationships (Lin, 2003). Social capital has the potential to reduce community problems, restore economic development (Krishna, 2000) and entrepreneurial characteristics (Damirchi, Shaifai and Paknazar 2011; Doh1 and Edmund, 2011). The social capital level in a community enhances economic and social welfare. Social capital is not only critical for sustaining bottom-up mechanism (Woolcock, 2004) but contributes to society's economic development and wellbeing (Maskell, 2000). Young potential entrepreneurs should focus more on bonding and bridging cognitive social capital (Woolcock and Narayan 2000) rather than structural social capital which confined to societal norms and rules (Uphoff, 2000; Grootaert and Van Bastelaer, 2001).

Interpretive Structural Modeling (ISM)

Interpretive structural modeling is a powerful tool for converting uncertain mental configuration into a certain and well-designed arrangement (Ahuja et al., 2009). It is widely used to assess complex socioeconomic systems (Warfield, 1976). Therefore, ISM provides its users with a systematic and comprehensive method for integrating group judgments in the development of "first-cut" structural models (Malone,

1975; Watson, 1978). It aids in retrieving qualitative information rather than quantifiable factors resulting from classical modeling approach (Janes, 1988). Hence, the graphical representation of output demonstrated by this technique (Sharma et al., 1994). The various steps of ISM methodology are as follow:

Step 1: Initially different enablers of social enterprenuership are diagnosed.

Step 2: The second stage establishes contextual relationship amongst enablers picked up in first stage.

Step 3: A structural self interaction matrix (SSIM) is developed for enablers which implies pairwise relationship among enablers under consideration.

Step 4: The core of ISM is transitivity analysis. Transitivity analysis operates on the following formula where if A=B, B=C, therefore it is deduced that A=C. This relation is studied by building reachability matrix from SSIM where transitivity is checked.

Step 5: Reachability matrix obtained in step 4 is branched into multiple levels.

Step 6: Depending upon contextual relationships in the reachability matrix, directed graph is developed and transivity links have been removed.

Step 7: The final output is achieved when digraphs are transformed into the interpretive structural model by superseding elemental nodes with statements.

Table 1: Enablers used in ISM Modeling of Social Entrepreneurship

S. No	Enablers of Social Entrepreneurship	Research Studies
1	Family Exposure	Dunn & Holtz-Eakin (2000); Kim et al. (2006); Fairlie & Robb (2007); Sandhu et al.(2011); Zellweger et al. (2011); Laspita et al.(2012).
2	Emotional Intelligence	Thorndike (1920); Slaski & Cartwright (2002); Shepherd (2004); Tsaousis & Nikolaou (2005); Zampetakis et al.(2009); Boren (2010)
3	Education	Lee et al. (2005); Turker & Selcuk (2009); Griffiths et al. (2009); Ernst (2011); Smith &Woodworth (2012); Hockerts (2015); Romero (2015).
4	Support from financial bodies and Universities	Henderson& Robertson (2000); Robertson et al. (2003); Li (2007); Shane (2003) Peterman & Kennedy (2003);Frank & Lüthje (2004);Schwarz et al. (2009); Fayolle & Gailly (2015); Saeed et al. (2015); Piperopoulos & Dimov (2015); Karimi et al. (2016).
5	Self –efficacy	Krueger et al.(2000);Markman et al. (2002); Peterman & Kennedy (2003); Giles, McClenahan, Cairns & Mallet (2004); Zhao, Seibert & Hills (2005);); Mair & Noboa (2006);Zhao et al.(2005);Pruett et al.(2009); Lee et al. (2011); Smith & Woodworth (2012); Prabhu et al.(2012); Pihie & Bagheri (2013); Aslam & Hasnu (2016); Wajeeh, Elali Badriah & Al-Yacoub (2016); Utami (2017).
6	Government Policies	Shane & Venkataraman (2000); Scott (2001); Franke & Lüthje (2003); Turker & Selcuk (2009); Bruton, Ahlstrom & Li (2010); Haque e t al (2013)Virick et al. (2015)
7	Involvement in social projects	Denhardt & Aristigueta; 2009; Lewis & Packard, (2012)
8	Empathy	Goetz, Keltner, & Simon-Thomas (2010); London (2010); Dees (2012); Groch, Gerdes, Segal & Groch (2012); Miller, Grimes, McMullen, Vogus & Wood (2012); Niezink, Siero, Dijkstra, Buunk, & Barelds (2012)
9	Entrepreneurial opportunities	Vogel (2017); Dimov (2007); Hill & Birkinshaw (2010) Alvarez & Barney (2007); McMullen & Shepherd (2006); Douglas (2013)
10	Autonomy	Autio et al. (2001); Raijman (2001); Douglas &Shepherd (2002); Schwarz et al. (2009); Kwong & Thompson (2016)
11	Creativity	Sternberg, 1999; Sternberg and Lubart (1999);Lee et al.(2001)
12	Social capital	Uphoff (2000); Grootaert & Van Bastelaer (2001); Woolcock & Narayan (2000); Lin (2003)

Structural Self-Interaction Matrix (SSIM) and Reachability Matrix

To identify the contextual relationship among enablers of social enterprenuership, experts opinion were taken from the world of academia and industry. Total fifty people were confabulated. The contextual relationship were established using four symbols (V, A, X, O) which further led to development of SSIM Matrix. Individual depiction of all symbols are given below.

V: i guides in the accomplishment of j element

A: j guides in accomplishment of i element

X: i and j elements guide each other in accomplishment

O: both i and j elements are not affiliated

The relevance of four symbols (V, A, X, O) are explained in Table 2. The symbol V found in the cell (1, 12) which shows element i (1) leads to element j (12). Therefore, in this kind of circumstances where i leads j, symbol V is positioned. Similarly, in cell (2,10) symbol A is observed which shows element j leads to element i whereas cell (1,3) depicts symbol X which implies that both enablers (i ,j) affect each other. Finally, cell (1, 10) having O shows lack of affiliation between two elements (i, j).

The next step is conversion of SSIM into binary matrix using binary digits (0,1). This matrix is also named as initial reachability matrix(Table 3). Few set rules are practiced under the binary conversion process which are as follows:

1. In SSIM matrix cell (i, j) having V symbol takes the binary digit 1 in initial reachability matrix and 0 in case of (j, i). Therefore, 1 has been put in cell (1, 12) whereas 0 has been placed in cell (12, 1).
2. Similarly in SSIM matrix, cell (i , j) having A symbol will take 0 in initial reachability matrix and cell (j, i) will be 1. Therefore, the cell (2, 10) has taken 0 and cell (10, 2) have taken 1 in initial reachability matrix.
3. If (i , j) and (j, i) is depicted with symbol X then both the cells will take 1 in initial reachability matrix. In case of cell (1, 3) in SSIM, both cell (1, 3) and (3, 1) is assigned with 1 in initial reachability matrix.
4. If cell (i, j) is depicted by O then it will takes 0 in both cell (i , j) and (j ,I). Cell (1, 10) and (10, 1) has been replaced by 0 in initial reachability matrix.

Before reaching final reachability matrix, transitivity analysis is infused in the matrix to attain accurate output (as explained earlier in the methodology). Table 4 presents the final reachability matrix.

Table 2: Structural Self -Interaction Matrix

Enablers	12	11	10	9	8	7	6	5	4	3	2	1
1	V	V	O	V	O	V	O	V	O	X	O	
2	V	O	A	V	V	O	O	O	O	A		
3	A	V	O	V	V	A	A	A	A			
4	O	V	V	V	O	V	A	V				
5	A	V	A	V	O	V	A					
6	O	O	V	V	O	V						
7	A	V	O	V	V							
8	O	V	O	V								
9	A	X	A									
10	V	V										
11	O											
12												

Table 3: Initial Reachability Matrix

Enablers	1	2	3	4	5	6	7	8	9	10	11	12
1	1	0	1	0	1	0	1	0	1	0	1	1
2	0	1	0	0	0	0	0	1	1	0	0	1
3	1	1	1	0	1	0	0	1	1	0	1	0
4	0	0	1	1	1	0	1	0	1	1	1	0
5	0	0	0	0	1	0	1	0	1	0	1	0
6	0	0	1	1	1	1	1	0	1	1	0	0
7	0	0	1	0	0	0	1	1	1	0	1	1
8	0	0	0	0	0	0	0	1	1	0	1	0
9	0	0	0	0	0	0	0	0	1	0	1	0
10	0	1	0	0	1	0	0	0	1	1	1	1
11	0	0	0	0	0	0	0	0	1	0	1	0
12	0	0	1	0	1	0	0	0	1	0	0	1

Table 4: Final Reachability Matrix

Enablers	1	2	3	4	5	6	7	8	9	10	11	12	Drivers
1	1	1*	1	0	1	0	1	1*	1	0	1	1	9
2	0	1	1*	0	1*	0	0	1	1	0	1*	1	7
3	1	1	1	0	1	0	1*	1	1	0	1	1*	9
4	1*	1*	1	1	1	0	1	1*	1	1	1	1*	11
5	0	0	1*	0	1	0	1	1*	1	0	1	1*	7
6	1*	1*	1	1	1	1	1	1*	1	1	1*	1*	12
7	1*	1*	1	0	1*	0	1	1	1	0	1	1	9
8	0	0	0	0	0	0	0	1	1	0	1	0	3
9	0	0	0	0	0	0	0	0	1	0	1	0	2
10	0	1	1*	0	1	0	1*	1*	1	1	1	1	9
11	0	0	0	0	0	0	0	0	1	0	1	0	2
12	1*	1*	1	0	1	0	1*	1*	1	0	1*	1	9
Dependence	6	8	9	2	9	1	8	10	12	3	12	9	

The final reachability matrix is designed to obtain reachability set and antecedent set (Warfield, 1974). Both sets aid in getting intersection sets of all the available elements. The ISM hierarchy is formed when reachability set and intersection set are matched together. The variable for which reachability set and intersection set are same have been given the highest priority in ISM hierarchy.

3.2 Level Partitions

Table 5: Partitioning of enablers

S. No	Reachability Set	Antecedent Set	Intersection Set	Level
1	1,2,3,5,7,8,9,11,12	1,3,4,6,7,12	1,3,7,12	VI
2	2,3,5,8,9,11,12	1,2,3,4,6,7,10,12	2,3,12	V
3	1,2,3,5,7,8,9,11,12	1,2,3,4,5,6,7,10,12	1,2,3,5,7,12	III
4	1,2,3,4,5,7,8,9,10,11,12	4,6	4	VII
5	3,5,7,8,9,11,12	1,2,3,4,5,6,7,10,12	3,5,7,12	IV
6	1,2,3,4,5,6,7,8,9,10,11,12	6	6	VIII
7	1,2,3,5,7,8,9,11,12	1,3,4,5,6,7,10,12	1,3,5,7,12	III
8	8,9,11	1,2,3,4,5,6,7,8,10,12	8	II
9	9,11	1,2,3,4,5,6,7,8,9,10,11,12	9,11	I
10	2,3,5,7,8,9,10,11,12	4,6,10	10	VI
11	9,11	1,2,3,4,5,6,7,8,9,10,11,12	9,11	I
12	1,2,3,5,7,8,9,11,12	1,2,3,4,5,6,7,10,12	1,2,3,5,7,12	IV

Formation of ISM Based Model

The structural model also known as diagraph is generated from the final reachability matrix. ISM model is formed by substituting nodes with statements after removing transitivity links which are shown in Figure 1. The model (Figure 1) indicates that government policies are the most crucial enablers for social entrepreneurship as it comes at the bottom of the ISM hierarchy. Entrepreneurial opportunities and creativity are the uppermost enablers in the model indicating them as least important enablers of social entreprenuership.

MICMAC Analysis

MICMAC analysis (Rajm Shankar and Suhaib, 2008) is an abbreviation for Matrice d'Impacts croises-multipication applique´ an classment (cross-impact matrix multiplication applied to classification). The MICMAC analysis is carried out using driving and dependence power. Driving and dependence power for each enabler shown in Table 4. The facilitators further classified into four categories: namely autonomous, dependent, and linkage and independent according to their driving and dependence power.

- The first compartment highlights autonomous enablers having weak driving and dependence power. No enablers fall under this category in the current study.
- Second compartment comprises of dependent enablers with weak driving but strong dependence power. The enablers which fall under this category are empathy (8), entrepreneurial opportunities (9) and creativity (11).
- Third compartment comprises of linkage enablers with extremely strong driver and dependence power. Emotional Intelligence (2), education (3), self-efficacy (5), involvement in social projects (7) and social capital (12) fall in this category.
- Fourth compartment highlights independent enablers having strong driving power but weak dependence power. Family exposure (1), support from financial bodies (4), government policies (6) and autonomy (10) fall in this category.

Driver													
	12	6											
	11		4						Linkage III				
	10												
	9			10			1		7	3,12			
	8	Independent (Driver) IV											
	7								2	5			
	6												
	5												
	4								Dependent II				
	3		Autonomous I								8		
	2												9,11
	1												
		1	2	3	4	5	6	7	8	9	10	11	12

Figure 2: MICMAC Analysis

Dependence

Discussion

India is the seventh largest country in the world having 17.5% world population. It is also the youngest country in the world according to demography with approximately two-thirds of the population aged below 35. Despite being the second fastest growing economy after China, India is home to around 40% of the world's poor, with 30% of its population living below the poverty line (CIA website). The country is still battling with socio-economic issues like illiteracy, malnutrition, and inadequate healthcare. These issues if not addressed timely, may further derail India from the growth trajectory. Social enterprises can help in addressing these issues by creating low cost and innovative solutions. The growth of social enterprises depends on numerous factors. In this study, we have identified some critical enablers of social entrepreneurship. Emphasis upon these enablers will provide impetus to the social entrepreneurship in India.

According to the ISM Model (Figure 1), government policy is driving university and financial bodies support that comes at the second level in ISM Hierarchy. It implies that the government must plan strategies that motivate universities and commercial organizations to extend support to social entrepreneurship. Collectively government policies and university and financial bodies support can be more useful in promoting social entrepreneurship. Autonomy is a result of a university and financial bodies support. Universities can inculcate the spirit of social entrepreneurship among students. They can create awareness, develop leadership qualities and orient the attitude of budding entrepreneurs which in turn enhance autonomy among students. Students need to have more freedom to implement their ideas. The

family exposure drives the feeling of self-efficacy among entrepreneurs. It shows that people learn a lot from their family. Family already in business develop self-efficacy among people.

Further self- efficacy is promoting education among people. Entrepreneurial opportunities and creativity come at the top of the ISM hierarchy indicating that they have weak driving power and are least significant in the social entrepreneurship and depends on empathy. Involvement in social projects enhances creativity among entrepreneurship.

Government policy has emerged as the most important enablers of social entrepreneurship in India as it comes in the bottom of the ISM hierarchy. This finding is consistent with the previous result which states that government policies enhance the entrepreneurial spirit of budding entrepreneurs (Zerbinati and Souitaris 2005; Michael and Pierce 2009). Social enterprises face many problems related to the legal and regulatory framework, market access, business support and development structure, training and workforce development (OECD Report, 2017). Social enterprises cannot thrive without addressing these challenges. Government support is a prerequisite to the growth of social enterprises in India. Social enterprises need the conducive business environment to grow.

The government needs to plan policies as per the need of social enterprise. Policies concerning easy financing, training and awareness, secure market access, assistance in developing structure and simplified legal and regulatory framework can work for social enterprises. The government should take initiatives to provide sustainable financing to social entrepreneurs. The lack of capital weakens the social enterprise's growth as banks do not readily offer loans to them. Policies that focus on the promotion of social enterprises and grassroots innovations must be emphasized upon greatly. The government needs to extend support to start-ups and investments having the social impact (British Council Report, 2016).

Second most important enabler of social entrepreneurship is university and financial body support. Support from universities and financial bodies can work as oxygen for social enterprise in India.

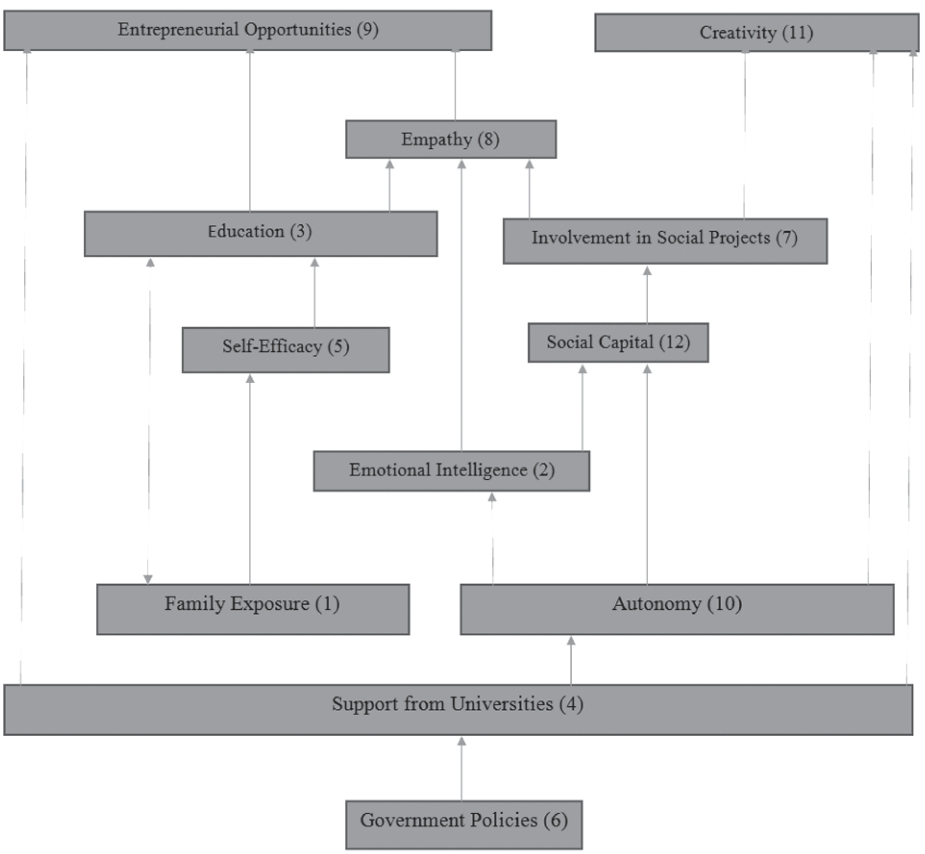

Figure 1: ISM based model for enablers of social entrepreneurship

Sustainable financial assistance for research work, incorporation of innovative entrepreneurial training programs in the curriculum can help in achieving social goals. Incubators and accelerators must establish for seed stage and early-stage social entrepreneurs at the university level. The big step in the direction of funding social pilot projects at the college level should be taken up. Appropriate mentoring, conducting workshops and training, regular funding, measuring social pilot impact, etc. need to be initiated for shaping young minds of our country. Emphasizing upon these enablers will provide impetus to the social entrepreneurship in India. Universities need to strengthen interaction with social enterprises to promote social entrepreneurship.

Research Implications

Indian economy has grown significantly in last one decade. Sustaining this growth requires India to address its numerous social and economic problems. The social enterprises have the potential to contribute to the economic development of the country. The findings of the study will guide policymakers to devise strategies to drive the growth of social enterprises in India. The study will act as a torchbearer for varied actors like policymakers, budding social entrepreneurs, researchers, angel investors, venture philanthropists, etc. The insights of research will aid government and policymakers in development of policies regarding simplification of the legal and regulatory framework, providing market access, training and business support and development structure to social entrepreneurs thereby strengthening social entrepreneurship in India. The growth of social enterprises will lead to the creation of new markets, organization, and new methods of production and will create economic opportunities for the poor. The development of affordable products and low-cost innovation provide a solution to people at the bottom of pyramid which till now has not been taken care.

Limitations and future scope

In this study, the ISM framework has been developed using twelve enablers of social entrepreneurship in India. More facilitators could have considered and categorized. Second, being the qualitative study the sample size of the survey is less. The third limitation is the generalizability of the prevailing conditions of developing economies that may differ depending upon the resource availability and thus, may contradict the proposed framework presented in the paper.

Future scope of this study lies in the identification of more enablers responsible for social entrepreneurship using Multi-Criteria Decision Making Techniques (AHP and ANP) and studying relationship among them. The investigation of more facilitators will be of great help to developing economies as well as to the field of social entrepreneurship. Further, this paper has established relationship among social entrepreneurships enablers using ISM methodology, but these relationships have not been statistically validated. Structural equation modeling is a multivariate technique that can be further used to verify these relationships. The direction for future research is to test and validate results using relevant models. Lastly, the same study can be replicated in developed countries to understand the enablers of social entrepreneurship there.

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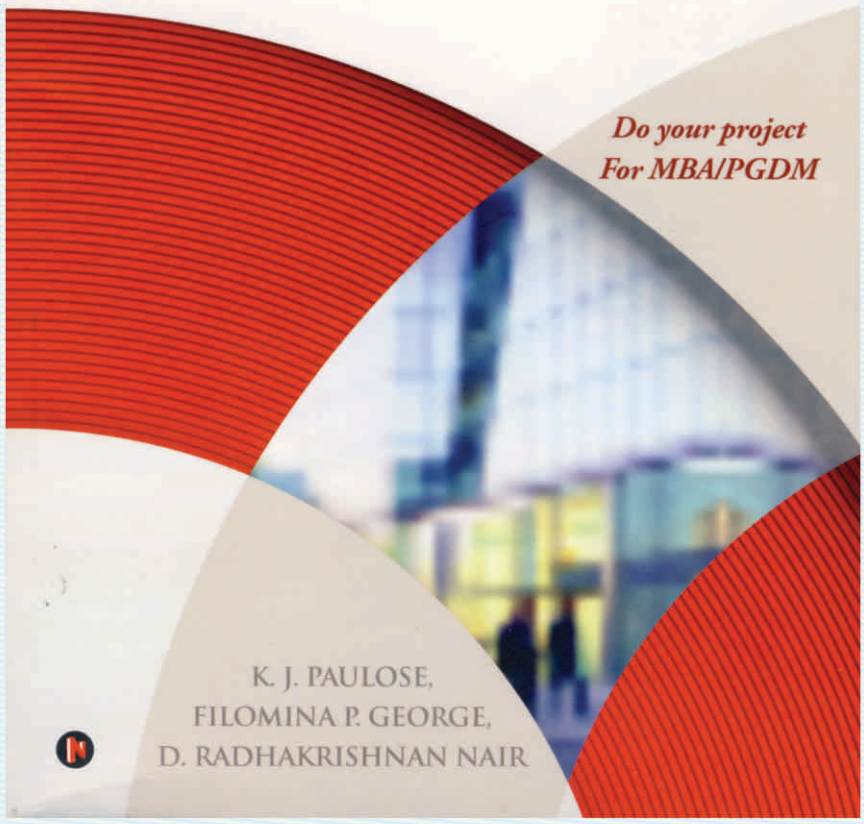

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