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Program-Budget Marginal-Analysis for University Strategic Planning and Execution

*Bilkisu Maijama-, Engku Muhammad Nazri***

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Prof Dr D N Venkatesh

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From the Editorial Desk

I am proud to announce the publication of the twelfth volume of **ACME: Endeavoring Thoughts towards pinnacle, A Journal of IT & Management ISSN: 0974-1763, UGC approval no. 64810**. Since inception, ACME has responded to the growth in submissions of new manuscripts. We are publishing papers invited from eminent scholars and researchers from India & abroad, which have been put through a double blind review process. The journal urges to deal with the concerns of putting more prominence on the junction of various management areas.

So many innovations are taking place on the borders of diverse knowledge spheres. The ACME team is determined to direct its vigor in digging the potential in borders of the different managerial disciplines. This necessitates horizontal thinking and challenging our own esteemed thoughts and views about challenges at hand.

The current issue is a very modest effort at meeting the mammoth objective of breaking away from the fair knowledge systems demonstrated by different researchers from all over India .This is done mostly through papers dealing with issues related to management. The manuscripts are peer reviewed as well as expert reviewed. My sincere thanks are due to the members of editorial and advisory boards, manuscript contributors and all others who have put in their might in compiling this issue.

To conclude, any journal is as good as its content. It is for you to raise the bar in every forthcoming issue. This will not be possible without ruthlessly honest and critical comments of its readers. Looking forward to a bagful of all these.

Dr. Ritvik Dubey

Editor-in-Chief

BUDGET ALLOCATION AND STRATEGIC PLANNING THROUGH PROGRAM-BUDGET MARGINAL-ANALYSIS

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Abstract

Decision making with priority on allocation and reallocation of university funds is based on the direction of the university, this is translated in strategic planning executed with transparency and accountability. It has become very important, particularly in universities, with recent cut for allocation by the government as a result of global financial crises. This research paper proposes implementation of PBMA which is mostly used in the health sector for strategic budget planning to be applied on the university strategic plan as a part of the strategic planning process. Firstly, the PBMA process was studied with the steps used for planning and with little adjustment applied to the university strategic plan. Secondly the marginal cost consequences were calculated considering the budget allocation from the previous year which was used for budget allocation for the current year through both existing and new introduced strategies used for improving the university rating. The outcome of this implementation using mixed integer programming using model showed that the targeted achievements could be realized within the allocated budget that was provided by the university. This adjusted-PBMA will be useful and suitable to be implemented by organizations that uses strategies for organizational improvement having limited budget allocation issues.

Keywords: Program budget marginal analysis, budget allocation, mixed integer programming model.

1.0 Introduction

Decision-making is a very important aspect in PBMA, most organizations are faced with the problem of decision making (Smith et al., 2016). The aim of applying PBMA is to answer the question whether or not to fund a particular strategic activity within the limited availability of resources through the method of prioritization about cost. Availability of resources to fund existing strategies with adequate benefit is needed. The decision to forfeit existing strategies with high funding to new introduced strategies with lower funding and greater benefit is a great importance. PBMA was first introduced in 1950 (Brambleby & Fordham, 2003b) in the USA cooperation with much application in defense department. Then the PBMA was used as a cost accounting tool to display time, deployment of available resources for different military objectives and also in allocation of missiles for destruction of military targets. Later after a decade (Brambleby & Fordham, 2003a), a researcher on PBMA bridge the gap between the military and healthcare application of PBMA procedure. Recently PBMA is an applicable tool for decision making, guidelines for clinicians as well as decisions by manufacturers and management of organizations (Polisena, Tran, & Cimon, 2013).

Mitton, Dionne, & Donaldson (2014) outlined seven steps for PBMA:

1. Determining the goal, aim and scope of the program.
2. Identifying the available resources for funding a program, that is the program budget.
3. Conducting marginal analysis
4. Determining the decision making criteria, to maximize benefits or profits as well as minimization of cost.
5. Evaluating the potential impact of investment and disinvestment in terms of benefit and cost of the activity.
6. Validating the outcome of the model proposed.

Based on the seven steps outlined above, there is a possibility that PBMA can also be applied in Other organizations with strategic activities using finances such as the university management to improve the university ranking with the limited available resources.

2.0 Research Problem

Strategic plan is used by different universities as a measure for rating the university. The strategic plan is used by the university as a guide and key indicator for progress in assessing the achievement of the university in line with the realities of the educational needs of this millennium (Hinton, 2012). Unfortunately most of this universities set up their strategies without due consideration on the availability of limited availability of resources, with less attention given to the cost of funding each strategy. This will surely lead to mismanagement of resources.

Recently there is a cut in allocation of budget by the government to organizations, with the university system inclusive. With this there is need to change or introduce new strategies, this will bring about three basic questions:

1. Should the new strategies/activities be included on the existing strategies/activities?
2. How to decide and finalize the strategies and activities to be implemented?
3. How should the budget be allocated to ensure that all the KPIs can be achieved?

2.1 Research Objectives

The objective of this research paper is to apply PBMA procedure with slight adjustment for budget allocation on university strategies. For illustration purposes, the scope of this research was confined to the selection and budget allocation on both existing and new introduced strategies in the university.

The selection of the activities to be funded through PBMA was executed by:

1. identifying the similarities between the steps in PBMA with the steps involved in planning and executing the university strategic plan,
2. adjusting the steps in PBMA to suit the needs of the steps involved in planning and budgeting of the strategies and KPIs in the university strategic plan,
3. Modeling the adjusted-PBMA steps for planning and budgeting of the strategies and KPIs in the university strategic plan.
4. Implementing the adjusted-PBMA steps for planning and budgeting of the strategies/activities in the university strategic plan.

3.0 Methodology

3.1 Proposed Model:

To optimize the budget allocated by the management university on both existing and new strategies (i.e. assuming that the university management has already decided on the total budget amount to be allocated. The amount then will be fully-utilized to achieve the intended KPIs as much as possible)

Decision Variables:

X_i = number of times strategy i to be implemented

Where

$i = 1, 2 \dots 10.$

X_{3new} = new introduced strategy which is total outbound students for the double degree to local universities in Malaysia.

X_{4newI} = new introduced strategy which is the total outbound students double degree to international universities in Indonesia.

X_{4newT} = new introduced strategy which is total outbound students for the double degree to international universities in Thailand.

Objective function:

Two objectives were considered simultaneously. The two objectives, listed according to priority are:

1. Objective 1: Minimize D
2. Objective 2: Minimize $w_1d_1 + w_2d_2 + w_3 + w_{3new} + w_{4newT} + w_{4newI} + w_5 + w_6 + \dots + w_{10}d_{10}$

Where D = total unused budget that is being allocated by the university management

w_i = weight of each activity $i = 1, 2, \dots 10$

d_i = point not achieved by strategy $i (i=1, 2, 3(\text{old, new}), 4(\text{old, newT, newI}), 5, \dots 10)$

The preemptive method was used to achieve the two prioritized objectives. To achieve objective 1, the model constraints are as follows.

Constraints:

Constraint 1: Total points to be accumulated for each KPI

$$P_i X_i + d_i = Point_i \quad (1)$$

for each $i = 1, 2, 3(\text{old}, \text{new}), 4(\text{old}, \text{newT}, \text{newI}), 5, \dots, 10$

Where

P_i = expected points that can be accumulated by each strategy i to achieve KPI i .

d_i = point not achieved by strategy i

Point_i = total points needed for KPI i .

Constraint 2: Total points to be achieved by all the strategies

$$\sum_{i=1}^{10} P_i X_i \geq 80\% \text{ of}$$

Where

$$i = 1, 2, 3 (\text{old}, \text{new}), 4(\text{old}, \text{newT}, n)$$

P_i = expected points that can be accumulated by each strategy i to achieve KPI i .

D = total unused budget that is being allocated

And

$X_i \geq 0$ and integer.

$$d_i \geq 0 \text{ and real}$$

$$D \geq 0 \text{ and real}$$

Here, the total expected points is by summing the points given for all the 13 strategies including the new strategies 3 to local universities, 4newT to international universities in Thailand and 4newI to international universities in Indonesia i.e 2.229 and 80% of the total point is therefore $0.8(2.229) = 1.783$.

Constraint 3: Total budget allocated by the university management

$$\sum_{i=1}^{10} \beta_i X_i + D = \text{Total budget allocated} \quad (3.3)$$

Where

$$i = 1, 2, 3 (\text{old}, \text{new}), 4(\text{old}, \text{newT}, n)$$

β_i = total budget needed to implement each strategy i .

And

$X_i \geq 0$ and integer.

Therefore, the entire constraints are as given below.

Constraint set 1:

$$0.004X_1 + \dots = 0.6$$

$$0.00029X_2 + \dots = 0.2625$$

$$0.0007X_3 + 0.0007X_{3\text{new}} + d_3 + d_{3\text{new}} = 0.3$$

$$0.0007X_4 + 0.0007X_{4\text{newI}} + 0.0007X_{4\text{newT}} + d_4 + d_{4\text{newI}} + d_{4\text{newT}} = 0.3$$

$$0.0784X_5 + = 0.250$$

$$0.00045X_6 + = 0.145$$

$$0.0003X_7 + = 0$$

$$0.0006X_8 + = 0.252$$

$$0.0032X_9 + = 0$$

$$0.0001X_{10} + = 0.120$$

Constraint 2:

$$0.004X_1 + 0.0029X_2 + 0.0007(X_{3old} + X_{3new}) + 0.0007(X_{4old} + X_{4newI} + X_{4newT}) + 0.0784X_5 + 0.00045X_6 + 0.0003X_7 + 0.0006X_8 + 0.0032X_9 + 0.0001X_{10} \geq 1.783$$

Constraint 3:

$$300X_1 + 6000X_2 + 500(X_{3old} + X_{3new}) + 1000(X_{4old} + X_{4newI} + X_{4newT}) + 20000X_5 + 96000X_6 + 96000X_7 + 125000X_8 + 72000X_9 + 500X_{10} + D \quad \text{total budget allocated.}$$

To achieve Objective 2, the same set of constraints used for Objective 1 were used, except for constraint 3. In this case, constraint 3 was replaced by constraint 3* as follows.

Constraint 3*:

$$300X_1 + 6000X_2 + 500(X_{3old} + X_{3new}) + 1000(X_{4old} + X_{4newI} + X_{4newT}) + 20000X_5 + 96000X_6 + 96000X_7 + 125000X_8 + 72000X_9 + 500X_{10} + D \quad \text{total budget given by the solution for Objective 1.}$$

3.2 Results Interpretation for Model C Objective 1

Model C is a multi-objective mixed-IP model, involving two objective functions. The model was solved using the preemptive method. The first objective to be achieved was to optimize the total budget that is by the university management for the next round of strategic planning year for both new introduced and existing strategies. Since the budget allocated is not known, we made an assumption that RM 80,000,000 will be allocated by the university management, which is less than the estimated budget needed to achieve the required point as found in model A (i.e. RM 91,093,000). The results are presented in Table 4.1.

Table 4.1 Results for Model C Objective 1

Variable	80,000,000
X_1	150
X_2	905

X_3	428
X_{3new}	0
X_4	428
X_{4newl}	0
X_{4newT}	0
X_5	3
X_6	278
X_7	0
X_8	377
X_9	0
X_{10}	20

The results in Table 4.5 show than when RM80,000,000 is allocated by the university management, the entire amount will be utilized (as indicated by $D = 0$) to achieve as many point as can be achieved.

1. 150 students development programs with an average of 30 students to be engaged in each program.
2. 905 students being offered scholarship.
3. 428 UUM students to be sent for outbound programs in local universities with credit transfer.
4. No UUM students to be sent for outbound programs in local universities with credit transfer (new introduced strategy)
5. 428 UUM students to be sent for outbound in international universities with credit transfer.
6. No UUM students to be sent for outbound in international universities with credit transfer (new introduced strategy to Indonesia)
7. No UUM students to be sent for outbound in international universities with credit transfer (new introduced strategy to Thailand)
8. Three promotional programs to selected foreign countries to increase the percentage enrollment of international students.
9. 278 staff with industrial experience to be hired.

-
10. No academic staff with teaching experience abroad will be needed for the next round of budget allocation. This activity has been fully achieved 100%.
11. 377 is the total number of academic staff with PhD
12. X_9 No academic staff should be employed or will be needed for the next round of budget allocation, this activity has been fully achieved.
13. Lastly, 20 staff must be sent for training.

Having achieved objective one, for objective two, is to minimize total budget allocated for the next round of strategic planning, with the allocation of weight to strategies giving priority to strategies with higher rating, the weight allocated to each strategic plan is presented in table 4.6. Prioritization of each strategy answers the research question 4, budget allocation practices with priority settings with regards to the maximization of benefits and minimization of cost. Objective 2 is analyzed with the allocation of budget 80,000,000 less than the estimated budget as presented in model A; the results are presented in table 4.2.

Table 4.2 Agenda with Weights for Existing and New Strategies

Agenda	Points by SETARA	Weight
X_1	0.6	0.0768
X_2	0.2625	0.0336
X_3	0.6	0.0768
X_{3new}	0.6	0.0768
X_4	0.66	0.0768
X_{4newl}	0.6	0.0768
X_{4newT}	0.6	0.0768
X_5	0.25	0.0320
X_6	0.4	0.0512
X_7	0.3	0.0384
X_8	0.6	0.0768
X_9	4	0.5120
X_{10}	0.2	0.0256

Table 4.3 Results for proposed Model Objective 2

Variable	80,000,000
X_1	150
X_2	905
X_3	428
X_{3new}	0
X_4	428
X_{4newl}	0
X_{4newT}	0
X_5	3
X_6	215
X_7	0
X_8	420
X_9	0
X_{10}	1200
Optimal value (the minimum unachieved SETARA point)	0.0035

The results in Table 4.4 show than when RM80,000,000 is allocated by the university management, the minimum unachieved point (as indicated by *optimal or solution value* = 0.0037).

1. 150 students development programs with an average of 30 students to be engaged in each program.
2. 905 students being offered scholarship.
3. 428 UUM students to be sent for outbound programs in local universities with credit transfer.
4. No UUM students to be sent for outbound programs in local universities with credit transfer.
5. 428 UUM students to be sent for outbound in international universities with credit transfer.

6. No UUM students to be sent for outbound in international universities with credit transfer.
7. No UUM students to be sent for outbound in international universities with credit transfer.
8. Three promotional programs to selected foreign countries to increase the percentage enrollment of international students.
9. 215 staff with industrial experience to be hired.
10. No academic staff with teaching experience abroad will be needed for the next round of budget allocation. This activity has been fully achieved 100%.
11. 420 is the total number of academic staff with PhD
12. X_9 No academic staff should be employed or will be needed for the next round of budget allocation, this activity has been fully achieved.
13. Lastly, 1200 staff must be sent for training.

The minimized unachieved point (as indicated by *optimal or solution value* = 0.0035). The unachieved point for each strategies is as follows,

4.3.1 What-if Analysis for model C

Validation analysis for model C with more and less than the estimated budget needed in model C at 100,000,000, 80,000,000 and 70,000,000 respectively and results represented in the tables bellow,

Table 4.4 What-if analysis for proposed Model Objective I

Variable	100,000,000	80,000,000	70,000,000
$\mathbf{0}$			
X_1	150	150	150
X_2	905	905	41
X_3	428	428	428
X_{3new}	0	0	0
X_4	428	428	428
X_{4newl}	0	0	0

X_{4newT}	0	0	0
X_5	3	3	3
X_6	362	278	167
X_7	0	0	0
X_8	420	377	419
X_9	0	0	0
X_{10}	1200	20	1200

Table 4.5 What-if analysis for proposed Model Objective 2

Variable	100,000, 000	80,000,000	70,000,000
X_1	150	150	150
X_2	905	905	905
X_3	428	428	428
X_{3new}	0	0	0
X_4	428	428	428
X_{4newl}	0	0	0
X_{4newT}	0	0	0
X_5	3	3	3
X_6	362	215	111
X_7	0	0	0
X_8	420	420	420
X_9	0	0	0
X_{10}	1200	1200	1200
Optimal Value (the minimum unachieved SETARA point)	0.0006	0.0035	0.0056

From the above result the solution value

5.0 Discussion and Conclusion

This research on adjusted PBMA is applicable to are problems with strategic activities for improvement. The major adjustment on the PBMA is Prioritization of strategies which are used for ranking the quality of the university. Integer programming is used for allocation and reallocation of budget on selected activities. The result presented in this study showed for next year of budget allocation, only few number of new activities will be included for budget allocation. The total amount by the management will not be used up completely less amount will be needed with the new introduced strategies. Prioritization of activities is based on MCC only, in reality, selection of determining preferences of activities to be founded should be given little consideration, hence preference factor should be included in future work.

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Capability based People Strategy for Digital Economy

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Abstract

Purpose This paper sets out to argue that the people strategy in digital era is radically different from the conventional format. The paper aims to research and discuss in detail, the various factors that influence the crafting of people strategy. It explores the developments in digital era that have influenced the business world and that have influence on people factor.

Design/methodology/approach The paper is based on secondary research, and has studied earlier research efforts in digital era starting from late 1990s to recent developments i.e., 2017. The various developments that have disrupted the business have been critically analysed.

Findings The paper highlights the key capabilities required by leadership and the employees, to help the organization stay competitive in digital era. A detailed comparison across carious facets of HR function have to carried out to identify the key differentiators between conventional Vs digital have been presented. The key cornerstone of people strategy in digital world is based on capabilities framework. In addition to soft and technical skills which are required for talent to be successful, the research has identified the digital skills which will critical for a manager/leader to be successful.

Originality/value The paper highlights key trends in advancement & impact on digital technologies on business. It brings into focus the need to assess, track and value the capabilities in general and digital capabilities for leaders and employees.

Keywords: People Strategy, Digital Economy, e-leadership skills, Digital Strategy

Introduction

The advent of digital world has changed the world of business for ever. The change spans across various dimensions such as Product & Service Innovation, Re-engineering the manufacturing shop floor, Customer Connect and Servicing, Stakeholder connect. The core dimension that is an underlying theme across the facets is the “Digital Factor”. The factor is not limited to creating and maintaining

Chuck Martin (1999) had identified 7 major trends i) emergence and mainstreaming of online business (ecommerce) ii) intranet facilitating formation of virtual teams of employees iii) boundary-less organizations that allow seamless connect between employees, suppliers and customers iv) commoditization of products due to real time interaction between organization and customers in product /service design & delivery iv) Designing organizations to capture customer

data v) Emergence of communities both within and external to organizations vi) Learning becomes pervasive by being real-time and all the time.

Sumanjeet (2012) had researched on e-skills for competitiveness of nations in 21st century. The e-skills required from European perspective.Tomi & Tiina (2015) in their research on corporate governance of data, have reviewed the existing practices related to corporate governance of digital data and have proposed a framework.

Ronald & Sylvain (2013) have identified six social media skills for leaders to be successful i.e, i) Creation of compelling content to present creative stories to audience ii) Be able to leverage on techniques for dissemination iii) Be adept in managing communication overflow iv) be able to drive social media utilization v) be able to create an enabling IT infrastructure & vi) staying ahead of curve. It is essential for organizations

Weizi (2016) in their research on e-leadership and strategy alignment have referred various levels of alignment i) strategy execution alignment through integration of organizational design and IS architecture ii) Technology Transformation alignment which involves identification of IT competences iii) Competition potential alignment by leveraging IT capabilities that can help organization in design and delivery of new products and service & iv) service level alignment by mapping business process with IT architecture.

Karla & Cara (2016) have identified the potential benefits of emotionally engaging customers through digital channels to build digital relationships with customers.Gerald et al (2016) in their research on aligning organizations for digital era has indicated that the preparation is an easy journey. Organizations need to focus on developing digital capabilities for the various dimensions such as company's activities, people, culture and structure are aligned towards goals of the organizations. The hurdles faced by organizations are 1) lack of resources ii) lack of talent iii) competing priorities and iv) limiting the digital initiatives to projects with scope being limited to a function or division. The initiatives needed for digital transformation are 1) Nurturing digital culture that bolsters risk taking ability, agility and spirit of collaboration in the talent 2) Engendering of commitment of senior leadership to digital initiatives 3) Investing in grooming digital skills of home grown talent 4) developing of soft skills which include transformative vision, forward thinking and change orientation

Methodology

In conformity with the theoretical character of the research the author has chosen such methods as theoretical analysis, generalisation, induction and logical methods. The method of theoretical analysis was used to study the relevant research papers devoted to the areas of Digital Economy, e-skills, leadership skills for digital era. As a result of the generalisation of empirical researches made by the contemporary researchers, the key aspects of impact organisations on account of advent of digital world are presented. The induction method allowed the combination of such elements of usage of e-skills for stakeholder connect, preparedness of organization in terms of infrastructure, leadership, & employees. Also the other aspects covered as culture prerequisites

such innovation, technology adaptation. The logical method was used to identify and justify the people management framework that can help in digital transformation of organizations.

People Strategy for Digital Economy

Nonako and Takeuchi (1995) defined KM as the capability of “a company as a whole to create new knowledge, disseminate it throughout the organization, and embody it in products, services and systems”. They categorize knowledge into implicit and explicit and methods adopted by organizations for capturing both implicit and explicit knowledge and monitor the adoption of the knowledge

Anna (2003) has identified that there is a need for strong linkage between conceptualization of strategy and intellectual capital for organizations operating in knowledge intensive industries that operate in a complex and highly uncertain environment.

Joan (2012) analysed the relationship between impact of direct and indirect externalities on the knowledge products. Other dimensions impacting are learning network externalities, business strategies and value of goods generated.

In the digital world, there is need for revisiting the entire people strategy from a functional and transactional perspective to that of which is linked to the business strategy and the capability of the organization. In the digital economy the capabilities/skills/competences have a major role in the performance of the organization. The generic capabilities required are 1) Innovation & Change Management 2) Technology Adaptation 4) Leverage & integrate technology with business.

Traditionally the strategy of organization in general and people strategy in specific were framed for static or relatively stable environment. In the digital era, the change is occurring every quarter and organizations are expected to adapt and respond to stay competitive.

In order to attract talent with these capabilities, it is important that the organization communicates and demonstrate that the current team in the organization has these capabilities and it is leading the market place by virtue of these capabilities. The talent in digital era is very choosy and will not look at employment opportunity with an organization unless the organization has good brand visibility, especially in the social and digital media. The talent who are tech savvy and are technology evaluate an organization in terms of suitability based on factors such as leadership vision, technology adaptation, and voice of stakeholders.

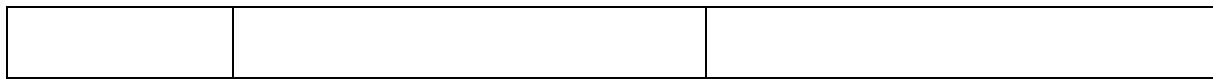
The People strategy proposed for digital era is anchored on the capability, and the differentiation between conventional and capability driven approaches is placed below:-

Dimension	Conventional Approach	Capability Driven Approach
Organizati	Traditionally organizations	In the digital era, it is

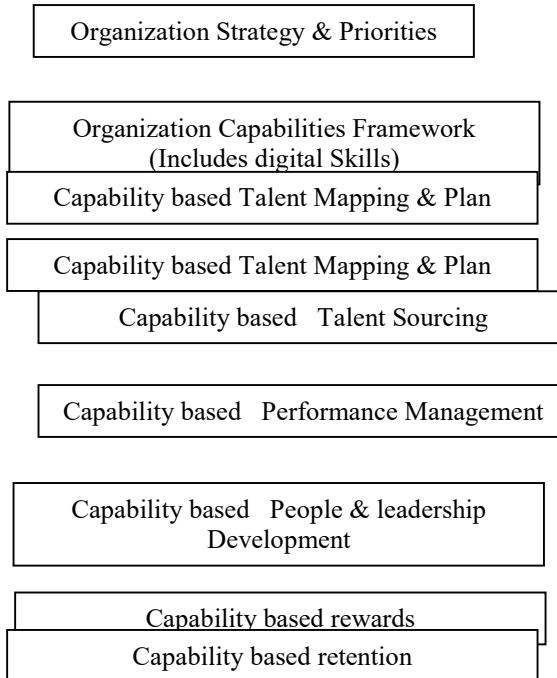
on Strategy	<p>have been crafting strategy largely by methods of linear extension and extrapolation of the past, keeping the relative stability of environment</p>	<p>imperative for organizations to continuously scan the environment for emerging technology trends and likely impact on organization business across value chain. Secondly, they need to carry out a capability assessment to validate the preparedness of organization to deal with new digital trends.</p> <p>Also organizations have to identify and assess the leadership both for generic and specific skills to adapt and lead organization for the next wave of digital change</p>
Capability Framework	<p>Organizations list the generic soft and technical skills based on the business context. Few organizations use the terminology of competency framework</p>	<p>In addition to technical competencies, the differentiating skills for leaders are i) Digital Literacy ii) Digital Vision iii) Advocacy iv) Presence – Walk the talk v) Communication vi) adaptability vii) self-awareness and viii) cultural awareness ix) Focus on customer experience x) Focus on data collection and utilization for decision making.</p>
Employer branding	<p>Organizations were not focusing on branding largely from consumer perspective and the employer branding was dependent on visibility leader through formal media such as print and electronic Media.</p>	<p>In the digital world, current employees continuously track the digital presence of their employer and take a sense of pride on the positive presence and visibility for their organizations. The adverse feedback/communication for their organizations can trigger cognitive dissonance towards their organizations and jobs that lead to disengagement impacting their</p>

		productivity and possible attrition
Capability Sourcing	Organizations were using either the soft and technical skills based approach or competency based approach to assess the quality of their talent and not so much to assess the readiness perspective	Organizations need to identify the digital capabilities which are specific to their context and have the talent in critical positions assessed for their readiness. These digital capabilities can be supplementary to the soft skills that they have identified and will operate in sync with the technical skills for the talent.
Capability & Performance Planning & Review	The employee's goals/KRAs were set from a logical extension and incremental growth. Performance planning has transitioned from annual calendar to quarterly reviews and in case of sales driven organizations to monthly reviews	In the rapidly changing digital world incremental goal cannot help an organization. The pace change needs rapid change and some complete transformation of strategy, products and services. The new products and services need new technologies either in design or delivery stages and sometime both. Thanks to digital world new product development and launches are being crowd sourced to connect and penetrate into the market faster. Performance planning and reviews have moved way from periodic to real time for connect and responsiveness to match market needs.

Capability & Leadership Planning	<p>The conventional approach has been looking at availability of next leaders who could replace the current incumbents categorized into High, Medium and Low Readiness on the HR score cards to demonstrate organizational preparedness on having sufficient leadership talent to take care of future needs</p>	<p>Capability & Leadership planning in digital era takes a step further. In addition to identification of talent, as a prerequisite criteria, organizations need to factor in the dimensions of digital skills needed by the leaders and digital skill readiness.</p> <p>This will ensure not the availability of leaders, but digitally savvy leaders to lead the organization in digital journey.</p>
Capability Rewarding	<p>The conventional approach of rewarding employees has been on their Key Result Area (KRA)/Key Performance Indicator (KPI) accomplishment and comparative benchmarking against employees in the same/similar level.</p> <p>Few organizations have started the practice of rewarding talent for their potential</p>	<p>In the digital context, organizations it is critical for organization to assess the performance of employees along with leveraging of digital skills to deliver performance.</p> <p>Employees are rewarded for the efforts undertaken to develop his/her digital skills, which are identified to be critical by the organization.</p>
Capability Retention	<p>The usual HR dash boards tracks the % of people who have left the organization across levels/locations, with reason-wise and performance rating-wise break-up. The retention strategies are designed based on this data/indicators</p> <p>The</p>	<p>In the digital context, retention of talent is to be tracked on the basis of digital capabilities and performance parameters. The performance linkage to the digital capabilities.</p>



Capability based People Strategic Framework



Conclusion

The advent of digital economy has accentuated the importance of People element as a critical success factor for organizational survival. How the competitive ability and growth is dependent on the digital capabilities of the leaders and the managers. The digital technologies have radically transformed the way business is planned and managed. The focus is on gathering market intelligence and aligning organizational response to real time to the market needs. The leaders and managers in the organizations need to have digital skills to see emerging trends, be able to envision a digital strategy and lead the organization to solution the products and services to customer needs

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ANALYSIS OF INDIAN LIFE INSURANCE INDUSTRY IN THE POST LIBERALIZATION ERA USING REGRESSION MODEL

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ABSTRACT

The paradigm shift has been witnessed in the Indian Insurance Industry over the last decade. In this study an attempt has been made to analyze the growth of life insurance industry in India in terms of some important components. Comprehensive data available through annual reports of IRDA has been used for this purpose. The estimated values of first year premium and total premium of public and private companies for the year 2020 have been obtained by using the method of least squares and linear trend analysis. The study indicates that liberalization has had a positive influence on the insurance market of India and the First Year and Total Premiums of life insurers are expected to steadily rise and the LIC will continue to be the market leader.

Keywords: Indian Insurance Industry, Trend, Least Square Regression Model (LSRM), Public and Private Insurance Corporation, First Year Premium (FYP).

INTRODUCTION

The Indian insurance industry has completed a full circle now. Beginning with a competitive industry full of foreign insurers, the Indian insurance industry led to nationalization of the industry in 1956, wiping out the foreign insurers. Once again it is back to the stage of open competition after liberalization of the industry through the enactment of IRDA Act 1999 and formation of the Insurance Regulatory and Development Authority (IRDA). The Insurance Laws (Amendment) Bill, which seeks to increase foreign direct investment (FDI) in the sector from 26 percent to 49 percent, has received clearance from the government, with the Cabinet approving an ordinance to this effect.

While the insurance Bill's aim is to improve products and services, the key reform being proposed is an increase of foreign investment from 26 percent to 49 percent in local insurance companies. The composite limit will include all forms of foreign investment, including those by foreign institutional investors and foreign portfolio investors. This could be a significant move to generate and invite FDI and help the sector expand.

There were some good initiatives such as sale of insurance products on the Common Service Centre (CSC) platform but the numbers were not forthcoming, implying the necessity of a marketing drive, rather than the money, to make it successful. The industry needs to focus on devising customised products for people whose income levels are higher while keeping generic products for the entry-level customers. Bringing down health costs to make health insurance affordable, focus on disaster management, climate change and the agriculture sector are some of the new focus areas of the regulator.

REVIEW OF LITERATURE

Several studies have been conducted in India to examine the relationship between the performance of insurance industry and economic development. Nagaraja (2015) in his study tried to vindicate the relationship between the performance of insurance industry and economic development. The study showed a negative trend in the growth rate in terms of number of new policies issued and the insurance premium. Reasons and contributing factors for this state of affairs is highly essential. The paper primarily deals with these aspects of insurance industry and a comparative analysis of both private and public sectors of life and non-life insurance industry was done.

Anju verma and Renu Bala (2013) in their article “The relationship between Life Insurance and Economic growth: Evidence from India” examines the relationship between the life insurance and economic growth in India. The total life insurance premium (TLIP), and total life insurance investment (TLII), are used as proxy for life insurance and Gross Domestic Product (GDP) is used for the economic growth. The findings of the study are that life insurance significantly influences the economic growth in India.

Venkatesh M (2013) in his paper “A Study of Trend Analysis in Insurance Sector in India” discusses the history of insurance and analyzes the life insurance industry in India. The study reveals that Indian insurance sector is increasing rapidly and trend percentages are increasing over the year. The author also focuses of insurance density and stated that in spite of higher insurance growth rate India has less insurance density as compared to world density.

Shendey B K and Neelkant Rao (2010), in his paper titled “Trends in Insurance Industry in India since 21st Century” opined that the privatization of insurance industry increases the growth of this

sector and the monopoly of LIC has been overcome. The total life insurance premium has increased four-folds since liberalization of insurance industry. He also stated that the life insurer continuously focuses on the product innovation and new schemes to increase its policyholder base. Basavanhappa C and Rajanalkar L (2009) in their article “Performance of Life Insurance Companies: A Comparative Study”, show that the private insurance companies have performed well over the year. The market share of private life insurance companies were increasing over the year which create a lot of opportunity for them. There was a cut throat competition in this sector which would be beneficial to all. To get the competitive advantage over the competitor, companies bring out the innovative products and provide various facilities to the customer.

Sumninder Kaur Bawa (2007) presents an in depth analysis of LIC’s performance in respect of various indicators since the policy of liberalization was introduced in the country. The productivity analysis of the Corporation has also been carried out using different parameters. The portfolio management of the Corporation has been explained in detail in respect of loans and investments. The book also identifies key determinants of the performance of LIC and makes recommendations for improving it.

Shilpa Rastogi and Runa Sarkar (2007), in their study, “Enhancing Competitiveness: The Case of the Indian Life Insurance Industry”, identify the causes and the objectives with which the sector was reformed in 2000, and conclude that only in the last decade, the hybrid model of privatization with regulation adopted by the Government has yielded positive results.

Tapen Sinha (2005) examines the regulatory regime that existed before independence. This paper discusses the importance of rural sector and possible impact of privatization on it. It concluded that one sure sign is emerging in the insurance business is the convergence of the different parts of the financial sector. The IRDA has taken a slow approach. It has been very cautious in granting licenses. Too many regulations kill the incentive for the newcomers

while two related regulations may induce failure and fraud that led to nationalization in the first place.

Nalini Prava Tripathy and Prabir Pal (2005) outline the strategies to be adopted for successful marketing of insurance products. They present the need of a new legislative framework in the changed scenario of the financial market.

Sudarsan Reddy, Mohan Reddy and Sivarami Reddy (2004) in their study "Liberalization of Insurance: Opportunities and Challenges", observe that in liberalized environment, nationalized insurance companies will continue to maintain their dominant position in the market, at least in the foreseeable future. However given the enormous potential of the Indian market, it is for the insurers to come out with new products, better packaging and improved customer service. Product innovation and channel diversification will gain momentum, in line with global trend of financial service convergence.

Divya Negi and Praveen Singh (2012) in their study found five important factors influencing the purchase of a life insurance product, namely; product quality, brand image, service quality, customer friendliness, brand loyalty and commitment. Product Quality and Brand Image came out as the highest ranking factors while Brand Loyalty has been rated as the least important factor influencing the purchase of a life insurance product. The study observed that these factors vary significantly across various demographic characteristics of the respondents.

Kumar (2003) in his article titled, 'Development of Insurance in India' had emphasized on the various issues relating to insurance business in India like liberalisation, privatisation, regulator's issues and future possibilities, etc. Potential private entrants expect to score in the areas of customer service, speed and flexibility. Their entry will mean better products and choice for the customer. As is witnessed in other countries where liberalization took place in recent years, nationalized players will continue to hold strong market share

positions, but there will be enough business for new entrants to be profitable.

Samuel (2003) traces the evolution of the insurance market in India. The paper deals with the theoretical aspects, historical perspectives of insurance in India, the business and investments of life and non-life insurance and an assessment of insurance penetration in India in comparison with world standards. With the entry of private players into the insurance business, it is expected that competition would increase and overall functioning of the insurance sector would improve. The liberalization process initiated in the insurance sector is expected to bring about better integration of the financial markets and promote financial development of the country.

Ayyar (2000) in the article examines the various issues of significance to LIC and to policy-holders on the entry of new players into the industry. New entrants in this area have technical collaboration with companies having headquarters in countries like the USA, UK, Australia, etc. They will bring in new insurance products and administrative procedures. This will be like opening of all windows and allowing the wind to blow in from all directions. Thus, it is expected that the life insurance business in India will benefit and grow on sound lines. Competition will be in the form of new products from other insurers and aggressive marketing strategies.

Praveen Singh and Divya Negi (2011) in their research work “Growth of Insurance Services in the Himalayan Region of India” analyze the growth of life insurance industry in Uttarakhand state during the post liberalization era. It was analyzed in terms of growth in premium, new policies issued, number of offices, and profitability of insurers in the state. The expected values of First Year Premium for LIC and private insurers are obtained using linear trend analysis for the year

2016. No further study has come across to the researcher for analyzing the growth of life insurance industry and its projection, in Indian context. This study aims to fill this gap.

OBJECTIVES OF THE STUDY

- (1) To analyze the growth of life insurance industry in India in the post liberalization era.
- (2) To estimate a trend for growth of the LIC and private insurers by the end of the year 2020.

RESEARCH METHODOLOGY

The research design formed for this research study is descriptive in nature. Data which have been collected and used in this study are secondary which are collected from secondary sources such as text books, national as well as international research papers, articles, newspapers and largely from annual reports of IRDA. The statistical tools which have been used in this study are the regression (method of least squares) and the expected values are obtained using linear trend. The factors studied in detail include First Year Premium (here after, FYP), Total Premium, market share, new policies issued, profitability of LIC and Private Companies.

GROWTH OF INDIAN INSURANCE INDUSTRY IN POST REFORM PERIOD

At the time of liberalization, LIC was the only insurer in life insurance market. By the end of March 2016, there were twenty-four market players in life insurance industry. While there were 5373 offices of the life insurance industry by March 2007, the number has increased to 12018 by March 2010 and then decreased to 11071 offices by the end of 2016. During the period, while the number of offices of LIC has increased from 2301 to 4892, the offices of the private sector players increased from a mere 3072 in 2007 to 6179 in 2016.

Growth in Premium

Life insurance industry recorded a premium income of `366943.23 crore during 2015-16 as against `328102 crore in the previous financial year, registering growth of 11.84 per cent (4.39 per cent growth in previous year). While private sector insurers posted 13.64 per cent growth (14.32 per cent growth in previous year) in their premium income, LIC recorded 11.17 per cent growth (1.15 percent growth in previous year)

While renewal premium accounted for 62.16 per cent (65.46 per cent in 2014-15) of the total premium received by the life insurers, first year premium contributed the remaining 37.84 per cent (34.54 percent in 2014-15). During 2015-16, the growth in renewal premium was 6.20 per cent (10.72 per cent in 2014-15). First year premium registered a growth of 22.53 per cent in comparison to a decline of 5.81 per cent during 2014-15.

Table 1 shows the growth in the first year premium of both LIC and private companies. The immense growth in first year premium of LIC from Rs.9700.98 crore in 2000-01 to Rs. 90808.79 crore in 2013-14 is visible and so is the growth of the same for private companies from a meager Rs.6.45 crore in 2000-01 to Rs.29510.87 crore in 2013-14 which totaled to Rs.120319.66 crore for the industry in 2013-14.

Table 1: First Year Life Insurance Premium (in Rs. Crore)

Year	LIC	Private Sector	Total
2000-01	9700.98	6.45	9709.4
2001-02	19588.77	268.51	19959.21
2002-03	15976.76	965.69	16924.01
2003-04	17347.62	2440.71	19796.91
2004-05	20653.06	5564.57	26236.69
2005-06	28515.87	10269.67	38823.61
2006-07	56223.56	19425.65	75746.38
2007-08	59996.57	33715.95	93719.23
2008-09	53179.08	33827.15	86994.87
2009-10	71521.9	38372.12	109928.5
2010-11	87012.35	39385.84	126398.19

2011-12	81862.25	32079.92	113942.17
2012-13	76611.50	30749.58	107361.08
2013-14	90808.79	29510.87	120319.66
2014-15	78509.72	34821.81	113329.52
2015-16	97891.51	40970.80	138862.31

Data Source: IRDA Annual Reports of various years

The Table 2 below shows the growth in total premium for both LIC and private insurers in India. The total premium for LIC rose from Rs.34892.02 crore in 2000-01 to Rs.236942.30 crore in 2013-14 registering an increase of 13.48% over the previous year. On the other hand, total insurance premium for private insurers increased to Rs.77,340.90 crore showing a negative growth rate of 1.35% over the previous year. This brought the industry total to Rs.3,14,283.20 crore with a growth rate of 9.43% while the growth during the previous financial year 2012-13 was only 0.05% which showed positive growth rate for LIC but negative growth rate for the private players.

Table 2: Total Life Insurance Premium (in Rs. Crore)

Insurer	LIC	Growth	Private Total	Growth Rate	Industry	Growth Rate
		Rate				
2000-01	34892.02		6.45		34898.47	
2001-02	49821.91	42.79	272.55	4125.58	50137.25	43.67
2002-03	54628.49	9.65	1119.06	310.59	55757.20	11.21
2003-04	63533.43	16.30	3120.33	178.83	66670.05	19.57
2004-05	75127.29	18.25	7727.51	147.65	82873.05	24.30
2005-06	90792.22	20.85	15083.54	95.19	105896.60	27.78
2006-07	127822.84	40.79	28253.00	87.31	156116.60	47.42
2007-08	149789.99	17.19	51561.42	82.50	201368.60	28.99
2008-09	157288.04	5.01	64503.22	25.10	221796.30	10.14
2009-10	186077.31	18.30	79373.06	23.05	265468.70	19.69
2010-11	203473.4	9.35	88165.24	11.08	291638.60	9.86
2011-12	202889.28	-0.29	89182.83	1.15	292072.10	0.15
2012-13	208803.58	2.92	78398.91	-12.09	287202.49	-1.67
2013-14	236942.3	13.48	77340.90	-1.35	314283.20	9.43
2014-15	239667.65	1.15	88434.36	14.32	328102.01	4.39
2015-16	266444.21	11.17	100499.03	13.64	366943.23	11.84

Data Source: IRDA Annual Reports of various years

Market Share

On the basis of total premium income, the market share of LIC increased from 72.70 percent in 2012-13 to 75.39 percent in 2013-14. But, the market share of private insurers had gone down from 27.30 percent in 2012-13 to 24.61 percent in 2013-14.

The market share of private insurers in first year premium was 24.53 percent in 2013-14 (28.64 percent in 2012-13). The same for LIC was 75.47 percent (71.36 percent in 2012-13). However, in renewal premium, LIC had a share of 75.34 percent in 2013-14 (73.5 percent in 2012-13) when compared to 24.66 percent (26.50 percent in 2012-13) share of private insurers as is shown in the Table No.3 below.

I) Table 3: Market Share of Life Insurer (in percentage)

Insurer s/ Year	FIRST YEAR PREMIUM			RENEWAL PREMIUM			TOTAL PREMIUM		
	LIC	Pvt.	Total	LIC	Pvt.	Total	LIC	Pvt.	Total
2000-01	99.93	0.07	100	100	--	100	99. 98	0.0 2	10 0
2001-02	98.65	1.35	100	99.9 9	0.1	100	99. 46	0.5 4	10 0
2002-03	94.3	5.7	100	99.6	0.4	100	97. 99	2.0 1	10 0
2003-04	87.44	12.56	100	98.5 5	1.45	100	95. 29	4.7 1	10 0
2004-05	78.78	21.22	100	96.1 8	3.82	100	90. 67	9.3 3	10 0
2005-06	73.52	26.48	100	92.8 2	7.18	100	85. 75	14. 25	10 0
2006-07	74.35	25.65	100	89.0 3	10.9 7	100	81. 92	18. 08	10 0
2007-08	64.02	35.98	100	83.4 2	16.5 8	100	74. 39	25. 61	10 0
2008-09	61.12	38.88	100	77.2 4	22.7 6	100	70. 92	29. 08	10 0
2009-10	65.08	34.92	100	73.6 4	26.3 6	100	70. 1	29. 9	10 0

2010-11	68.85	31.15	100	9	70.4	26.3	100	69.78	30.22	10.0
2011-12	71.85	28.15	100	1	69.9	30.0	100	70.68	29.32	10.0
2012-13	71.36	28.64	100		73.5	26.5	100	72.70	27.30	10.0
2013-14	75.47	24.53	100	4	75.3	24.6	100	75.39	24.61	10.0
2014-15	69.27	30.73	100	4	75.0	24.9	100	73.05	26.95	10.0
2015-16	70.50	29.50	100	9	73.0	26.1	100	72.61	27.39	10.0

Data Source: IRDA Annual Reports of various years

New Policies Issued

During 2013-14, life insurers issued 408.72 lakh new policies, out of which, LIC issued 345.12 lakh policies and the private life insurers issued 63.60 lakh policies. While LIC reported a decline of 6.17 percent (against a growth of 2.88 percent in 2012-13) in the number of policies issued over the previous year, the private sector insurers continued the previous years' experience of significant decline and reported a dip of 14.11percent (against a decline of 12.88 percent increase in 2012-13). Overall, the industry witnessed a 7.50 percent decline (against a decline of 0.01 percent in 2012-13) in the number of new policies issued as shown in the Table 4 below.

This shows that the negative trends are not getting arrested and overall growth of business is getting affected. Table 4 and figure 1 below shows that LIC has continuously led the industry in number of new policies issued which has culminated into a good rate of growth of policies issued in the country. Figure 1 below shows linear uptrend in LIC, private sector insurance and overall insurance industry for new policies issued. But this trend is high for LIC.

Table 4: New Policies Issued by Life Insurers (in numbers)

Year	LIC	Growth (in %)	Private Sector	Growth (in %)	Total	Growth (in %)
2000-01	19673000				19673000	
2001-02	23275476	18.31			23275494	18.31
2002-03	24545580	5.46	825094		25370674	9.00

2003-04	26968069	9.87	1658847	101.05	28626916	12.83
2004-05	23978123	-11.09	2233075	34.62	26211198	-8.44
2005-06	31590707	31.75	3871410	73.37	35462117	35.29
2006-07	38229292	21.01	7922274	104.64	46151566	30.14
2007-08	37612599	-1.61	13261558	67.40	50874157	10.23
2008-09	35912667	-4.52	15010710	13.19	50923377	0.10
2009-10	38863327	8.22	14362117	-4.32	53225444	4.52
2010-11	37038000	-4.70	11114000	-22.62	48152000	-9.53
2011-12	37571000	1.44	8442000	-24.04	44193000	-8.22
2012-13	36782000	-2.10	7405000	-12.28	44187000	-0.01
2013-14	34512000	-6.17	6360000	-14.11	40872000	-7.50
2014-15	20171000	-41.55	5737000	-9.79	25908000	-36.61
2015-16	20547000	1.86	6192000	7.92	26738000	3.20

Data Source: IRDA Annual Reports of various years

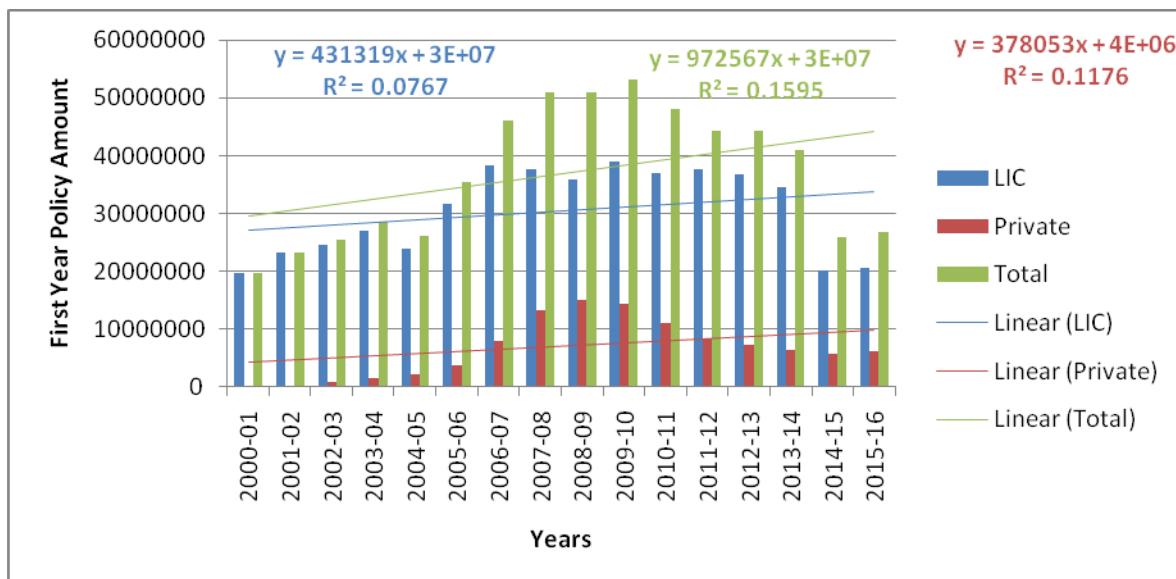


Figure 1: New Policies Issued 2000-01 to 2015-16

DATA ANALYSIS AND INTERPRETATION: Data collected from the secondary source, has

been properly arranged, and interpretation of the analysis is given in the following lines:

Estimation of First Year Premium

Estimation of First Year Premium of LIC and Private Companies has been done using the method

of Least Squares Method. Following two equations of Least Square have been used :

$$\sum Y = NA + B \sum X \quad \text{---(i)}$$

$$\sum XY = A \sum X + B \sum X^2 \quad \text{---(ii)}$$

Assuming $\sum X = 0$, the above two equations have been reduced to the following two equations :

$$A = \sum Y/N$$

B = $\sum XY / \sum X^2$, and value of A and B have been derived from the calculation given in following

Table 5 for LIC and Table 6 for private insurance companies.

Table 5: Estimation of First Year Premium of LIC

Year	First Year Premium (Y)	2 x Time Deviation from 2008.5 (X)	X ²	XY
2001	9700.98	-15	225	-145514.7
2002	19588.77	-13	169	-254654.01
2003	15976.76	-11	121	-175744.36
2004	17347.62	-9	81	-156128.58
2005	20653.06	-7	49	-144571.42
2006	28515.87	-5	25	-142579.35
2007	56223.56	-3	9	-168670.68
2008	59996.57	-1	1	-59996.57
2009	53179.08	1	1	53179.08
2010	71521.9	3	9	214565.7
2011	87012.35	5	25	435061.75
2012	81862.25	7	49	573035.75
2013	76611.5	9	81	689503.5
2014	90808.79	11	121	998896.69
2015	78507.72	13	169	1020600.36
2016	97891.51	15	225	1468372.65
N=16	$\sum Y = 865398.29$	$\sum X = 0$	$\sum X^2 = 1360$	$\sum XY = 4205355.81$

Calculation of the value of A and B by least square method:

$$A = \sum Y/N = 865398.29/16 = 54087.39$$

$$B = \sum XY / \sum X^2 = 4205355.81 / 1360 = 3092.17$$

$$Y_{LFYP} = A + BX_{LFYP}$$

Putting the values, calculated above, in the above equation we get,

Where, Y_{LFYP} is estimated value of first year premium for the financial year 2020 of LIC, which has been calculated in the following line and X_{LFYP} is the variable calculated for the model as 2 times of time deviation from the year 2008.5. Calculation has been shown in table 5.

$$Y_{LFYP2020} = 54087.39 + 3092.17 \{(2020-2007.5) * 2\}$$

$$Y_{LFYP2020} = 54087.39 + 71119.91$$

Y_{LFYP2020} = 125207.3 crore

Figure 2: First Year Premium of LIC

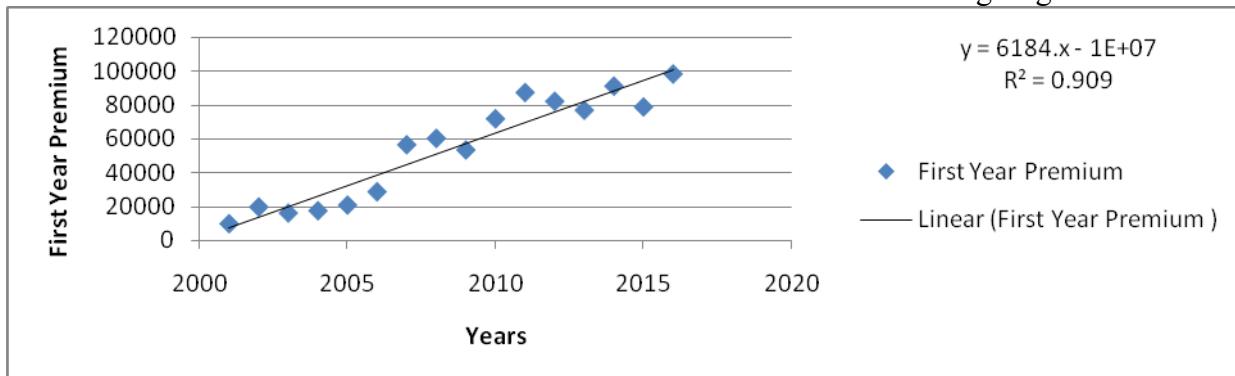


Fig. 2 above shows the trend line for the first year premium of LIC and the estimated growth in future.

Interpretation

Based on the middle years 2008 and 2009 the trend value for the year 2020 can be calculated using the linear function $Y=A+BX$, where, A & B are constant. If we substitute the values in the trend line equation, the expected first year business in India for LIC for the year 2020 is Rs. **125207.3** crore. It shows that insurance business of LIC in India is in increasing trend.

Table 6: Estimation of First Year Premium of Private Companies

Year	Total Premium	2 * Time Deviation from 2008.5	X ²	XY
(Y)	(X)			
2001	6.45	-15	225	-96.75
2002	268.51	-13	169	-3490.6
2003	965.69	-11	121	-10623
2004	2440.71	-9	81	-21966
2005	5564.57	-7	49	-38952
2006	10269.67	-5	25	-51348
2007	19425.65	-3	9	-58277
2008	33715.95	-1	1	-33716
2009	33827.15	1	1	33827.2
2010	38372.12	3	9	115116
2011	39385.84	5	25	196929
2012	32079.92	7	49	224559
2013	30749.58	9	81	276746
2014	29510.87	11	121	324620
2015	34821.81	13	169	452684

2016	40970.8	15	225	614562
N=16	$\sum Y = 352375.29$	$\sum X = 0$	$\sum X^2 = 1360$	$\sum XY = 2020574$

Table 6 shows the calculation for estimation of First Year Premium of Private Companies.

Calculation has been done by using following equations:

$$A = \sum Y/N = 352375.29/16 = 22023.45$$

$$B = \sum XY / \sum X^2 = 2020574 / 1360 = 1485.72$$

$$Y_{PF} = A + BX_{PF}$$

Putting the values, calculated above, in the above equation we get,

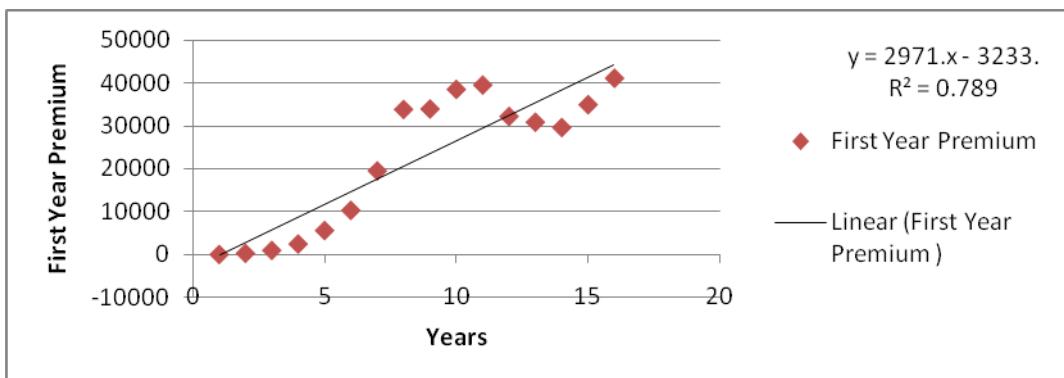
Where, Y_{PFYP} is estimated value of first year premium for the financial year 2020 of private insurance companies, which has been calculated in the following line and X_{PFYP} is the variable calculated for the model as 2 times of time deviation from the year 2008.5. Calculation has been shown in table 6.

$$Y_{p2020} = 22023.45 + 1485.72 \{(2020-2008.5) * 2\}$$

$$Y_{p2020} = 22023.45 + 34171.56$$

Yp₂₀₂₀= 56195.01 crore

Fig. 3 below shows the growth of first year premium of private companies as a whole and the estimated figure of growth in 2020.

Figure 3: Growth of First Year Premium of Private Insurance Companies

Interpretation

Based on the middle year 2008 and 2009 the trend value for the year 2020 can be calculated using the linear function $Y=A + BX$, where, A & B are constant. If we substitute the values in the trend line equation, the expected First Year Premium for Private Companies in India for the year 2020 is Rs. **56195.01** crore. It shows that business of private Companies in India is also in increasing trend but still it is not as much as LIC which confirms the lead position of LIC.

Total Premium

Table 7: Estimation of Total Premium of LIC

Year	Total Premium (Y)	2 * Time Deviation from 2008.5 (X)	X ²	XY
2001	34892.02	-15	225	-523380
2002	49821.91	-13	169	-647685
2003	54628.49	-11	121	-600913
2004	63533.43	-9	81	-571801
2005	75127.29	-7	49	-525891
2006	90792.22	-5	25	-453961
2007	127822.84	-3	9	-383469
2008	149789.99	-1	1	-149790
2009	157288.04	1	1	157288
2010	186077.31	3	9	558231.9
2011	203473.4	5	25	1017367
2012	202889.28	7	49	1420225
2013	208803.58	9	81	1879232
2014	236942.3	11	121	2606365
2015	239667.65	13	169	3115679
2016	266444.21	15	225	3996663

$$A = \sum Y / N = 2347993.96 / 16 = 146749.62$$

$$B = \sum XY / \sum X^2 = 10894162.02 / 1360 = 8010.41$$

$$Y_{TPL} = A + BX$$

$$Y_{TPL} = 146749.62 + 8010.41X_{TPL} \dots \dots \dots \text{(iii)}$$

Where, Y_{TPL} is estimated value of total premium for the financial year 2020 of LIC, which has been calculated in the following lines and X_{TPL} is the variable calculated for the model as 2 times of time deviation from the year 2008.5 which has been shown in the above table 7.

$$Y_{TPL2020} = 146749.62 + 8010.41 \{ (2020 - 2008.5) * 2 \}$$

$$Y_{TPL2020} = 146749.62 + 184239.43$$

$$\mathbf{Y_{TPL2020} = 330989.05 \text{ Crore}}$$

Figure 4: Total Premium of LIC

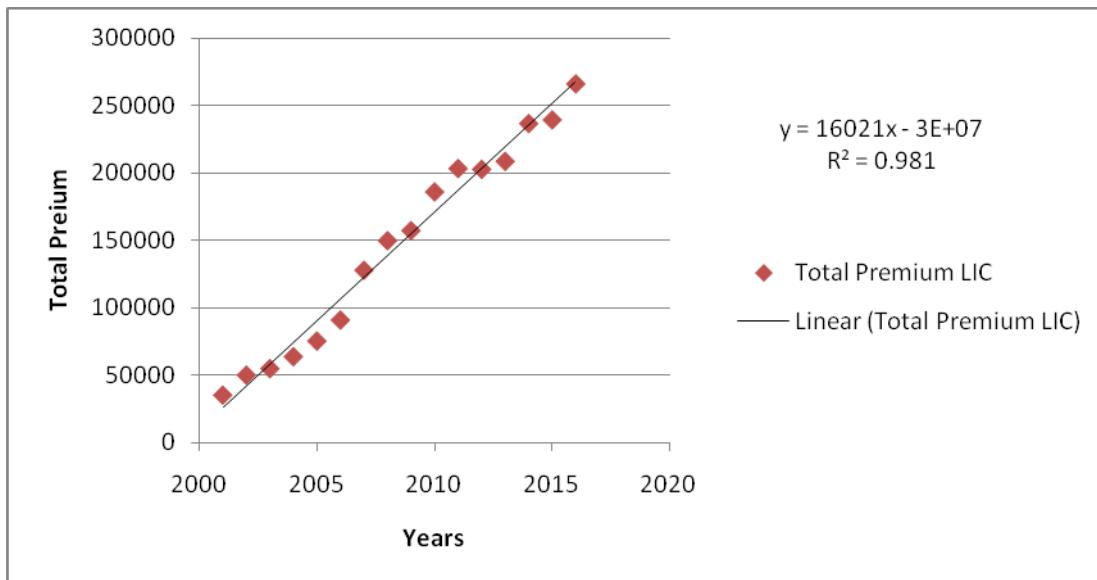


Figure 4 shows a definite upward trend in total premium of LIC till the year 2016.

Interpretation

Based on the middle year 2008 and 2009 the trend value for the year 2020 can be calculated using the linear function $Y=A+BX$, where, A & B are constant. If we substitute the values in the trend line equation, the total premium of business for LIC in India for the year 2020 is Rs. **330989.05** crore. It shows that the total premium of LIC in India is also in increasing trend.

Table 8: Estimation of Total Premium of Private Companies

Year	Total Premium (Y)	Time Deviation from 2008.5 (X)	X^2	XY
2001	6.45	-15	225	-96.75
2002	272.55	-13	169	-3543.15
2003	1119.06	-11	121	-12309.7
2004	3120.33	-9	81	-28083
2005	7727.51	-7	49	-54092.6
2006	15083.54	-5	25	-75417.7
2007	28253	-3	9	-84759
2008	51561.42	-1	1	-51561.4
2009	64503.22	1	1	64503.22
2010	79373.06	3	9	238119.2
2011	88165.24	5	25	440826.2
2012	89182.83	7	49	624279.8
2013	78398.91	9	81	705590.2
2014	77340.91	11	121	850750
2015	88434.36	13	169	1149647
2016	100499.03	15	225	1507485
N=14	$\sum Y = 773041.42$	$\sum X = 0$	$\sum X^2 = 1360$	$\sum XY = 5271337.52$

$$A = \sum Y / N = 773041.42 / 16 = 48315.09$$

$$B = \sum XY / \sum X^2 = 5271337.52 / 1360 = 3875.98$$

$$Y_{TPPC} = A + BX$$

$$Y_{TPPC} = 48315.09 + 3875.98 X_{TPPC} \dots \dots \dots \text{(iv)}$$

Where, Y_{TPPC} is estimated value of total premium for the financial year 2020 of private insurance companies, which has been calculated in the following lines and X_{TPPC} is the variable calculated for the model as 2 times of time deviation from the year 2008.5. Calculation has been shown in table 8.

$$Y_{TPPC2020} = 48315.09 + 3875.98 \{(2020-2008.5) * 2\}$$

$$Y_{TPPC2020} = 48315.09 + 89147.62$$

$$Y_{TPPC2020} = 137462.7 \text{crore}$$

Figure 5: Total Premium of Pvt. Insurers

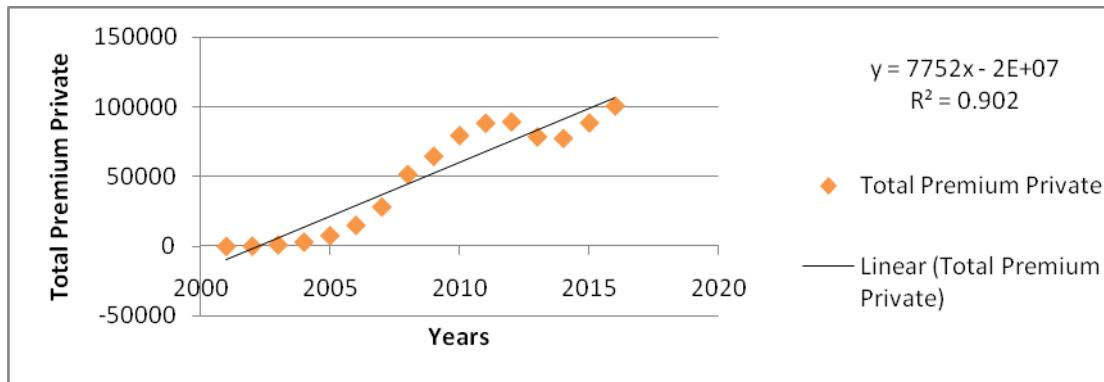


Fig. 5 above shows the positive trend of growth in total premium of private insurers and provides a bright view of the future.

Interpretation

Based on the middle year 2008 and 2009 the trend value for the year 2020 can be calculated using the linear function $Y=A+BX$, where, A & B are constant. If we substitute the values in the trend line equation, the expected Total Premium of Private Companies in India for the year 2020 is Rs. 137462.7 crore. It shows that business of Private Life Insurance Companies in India is in increasing trend but still the LIC remains the market leader as per the analysis.

CONCLUSION

The analysis of data shows that the economic reforms during liberalization and post liberalization have had a positive influence on the insurance market of India and the First Year and Total Premiums are expected to continuously rise but the LIC will still remain the leader in the market in line with the trend of various other countries where insurance industry was liberalized. But the growth in the past decade has not been significant as per the coverage of the vast population i.e. the insurance density, which shows that we have a long way to go in terms of real insurance protection to the common man.

The onus of increasing awareness about insurance, its importance and benefits and IRDA etc. lies on the insurers now. The private insurers as well as LIC have already started it by advertising through print and electronic media. In the process, the customers and prospective customers will also develop a better understanding of the nitty-gritty of various insurance products. Various interesting avenues of publicity of insurance could also be taken into consideration by the insurers. Well-trained workforce equipped with the Insurance Information System, the Internet and all sorts of knowledge about the availability of products (also, the need of new products, if any), the requirement and financial level of the insuring public etc. may result in higher understanding and awareness among people about the necessity of insurance in one's life.

In the process of the study it was observed that the insurers face several challenges in the present environment of fast pace of developments, enhanced awareness among people about insurance and changing needs of the customers. The challenges are: lack of qualified and skilled workforce, shortage of well-trained field staff, changing the perception about insurance, facing stiff competition, devising new distribution channels, introducing innovative and low priced products, retaining the customers, ensuring efficient customer service, maintaining high return on investments, laying of strong underwriting norms, controlling high expenses, reformulating certain IRDA regulations, liberalizing stringent investment restrictions, limited access to foreign capital, developing insurance information system and internet application, adapting to modernizing economy, non-conducive re-insurance regime and absence of renewal check mechanism. In order to realize the full potential of the Indian insurance industry, the solution of these challenges need serious thinking and discussion, and suitable measures need to be evolved to combat them.

Similarly, customers are also facing numerous problems in the volatile environment of the insurance industry presently, some of them are lack of awareness among the people about the benefits of insurance; rural areas have low insurance penetration; the population below poverty line cannot afford by themselves to buy insurance policies. The required attention of Central and

state governments and/or NGOs is not available to most of them; the customer service is not fully satisfactory; the claims settlement machineries of insurance companies are slow and inhospitable and they have not adequately modified their documentation procedures; unwillingness of the insurers to get impaired lives insured is very common; lapses control mechanism needs complete rethinking in order to get the lapsation rates lowered; and implementation of IRDA guidelines on redressal of grievances of the customers has so far been unsatisfactory and needs to be readdressed on top-priority basis.

FUTURE PROSPECTS AND SUGGESTIONS

Future avenues lie in further innovation in products and changes in product mix; products with built-in elements meant to overcome things like inflation; products providing insurance to impaired/disabled lives; pension driven plans which have huge growth potential; rural area business; selling products in supermarkets, malls, petrol pumps, airports etc.; use of new technologies, e.g., Insurance Information System, Internet etc.; bancassurance and involvement of NGOs in rural sector.

Insurance Companies may explore opportunities outside India, in areas such as Middle East, Africa and South Asia etc. Outsourcing of certain non-core jobs may be adhered to. Strict/severe penalties in case of non-compliance of the regulations are required to be incorporated in IRDA regulations. Present FDI cap of 26% should be raised to 49% and licenses may be granted to more insurers since the Indian insurance market offers tremendous opportunities to prospective insurers and can sustain about hundred insurers. Permission to the international re-insurers to operate in India through branches should be granted. There should be extensive linkages between regulatory bodies of different countries to develop international norms for insurance business. In a nutshell, we can say that Indian Life Insurance Industry has come a long way and still it has to go miles and miles till the market reaches its saturation and every insurable individual is insured adequately.

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Towards a Predictive Model for Effective e-Waste Management based on Rules and Regulations: A Study of Software Industry in India

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Abstract: In last few years information technology has seen tremendous growth all over the world. This growth has also brought a new kind of waste known as electronic waste or e-waste. The amount of this electronic waste is growing rapidly due to fast change in technology, reducing prices of electronic devices, low recycling rate of e-waste. This growing volume of e-waste is not only very harmful for human health and environment but also lead to resource depletion. So, its important to manage this e-waste effectively. The study was designed with an objective to predict the model for effective e-waste management based on factors identified from literature related to rules and regulations in Software industry. A total of 336 Software Developers of Software industry participated in the survey. A classification algorithm J48 was employed using WEKA and predictive model in the form of decision tree was developed.

Keywords: Recycling, e-Waste, Reuse, Collection, software industry, WEEE (Waste Electrical and Electronic Equipment)

INTRODUCTION

E-waste management in developing countries is a big challenge on account of poor legislation, lack of awareness about hazardous nature, poor infrastructure for takeback and recycling of e-waste. In most of the developing countries due to absence of legislation recycling of e-waste limited to private recycling with very less participation of consumer (Susan et al., 2008). Trans-boundary movements of huge amount of e-Waste from developed countries to developing countries (Wen et al., 2006), lack of legislation around e-Waste (Roa, 2007), dumping e-Waste into landfills, terrible working conditions for workers (Hanks et al., 2008), rigorous controls to prevent the illegal import and export of e-Waste (Rolf et al., 2005) and lack of relevant laws to adjust or control the selling behaviors of waste electric and electronic equipments (Wen et al., 2006) are some important drivers for effective e-Waste management.

Literature says that building blocks of rules and regulation related to e-waste management is known in different countries but how many of those are applicable in India are not known. So its important to know what will be the building blocks of rules and regulation related to e-waste management practices in India.

Thus paper attempts to predict a model of rules and regulation related to e-waste management in Indian software industry.

LITERATURE REVIEW

The EPR (Extended Producer Responsibility) concept was defined by Lindhqvist (2000), the objective of that concept was to make the manufacturer responsible for the whole life cycle of the product start from takeback, recycling to final disposal.

It has been observed that in most of the countries e-waste generated by businesses, institutions and government are stored in their storehouses. Only small portion of that e-waste sent to formal recyclers or donate to rural areas (Nie Y., 2003). In 1998 country like Taiwan and China enforced legislation for the take-back of four household appliances which include TV, Air conditioner, washing machine and refrigerator (Cai Y, Jiang B, 2002). In many countries people involved in recycling process of e-waste are getting average salary less than 3.63 USD per day (Sun Yat-sen University and Greenpeace, 2003).

Many developed countries have developed various rules and regulation from time to time to save environment and human health. In 2003 European parliament and council release document which focus on the restriction of hazardous substances like lead, mercury etc. in electrical and electronic equipments to minimize the risk during treatment and disposal of e-waste. Another directive was released in 2005 which focus on to reduce the generation of e-waste and encourage reduce and reuse of electronic equipments.

Initially there was no separate law for e-waste management in India. E-waste was interpreted under the rule of Hazardous waste and recycling facilities licensed under these rules. On 11th May, 2011 Ministry of Environment and Forests (MOEF) and Central Pollution Control Board (CPCB) release the document for environmentally sound e-waste management.

Author's contribution related to rules and regulations for e-Waste management are shown in Table I and Table II.

Table I: Literature Review related to Rules and Regulations

Author, Year	Contribution
DTSC, 2003	California banned the disposal of CRT(Cathode ray tube) and CED(consumer electronic devices) through landfills and incineration.
EU-EC Directive, 2003	In 2002 legislation related to the recycling of WEEE introduced.
GAO, 2005	Paper discussed about the development of rules and regulations related to recycling of e-waste.
Liu et al., 2006	Chinese government issues many policies to restrict illegal import and informal recycling.
Gregory et al., 2007	The California has passed the law to charge Advanced Recycling Fees (ARFs) at the time of product purchase.

Table II: Literature Review related to the Rules and Regulations in different context

Author, Year	Objective	Context	Finding
Wen et al., 2006	This paper introduces the current status of e-waste flow and recycling technologies.	China	Management policies play an important role to promote sustainable e-waste management practices.
Streicher-Porte et al., 2007	The comparative study of cost involved in the collection and transport of five products were discussed in this paper.	China	The paper concluded that in existing framework of policy formal recyclers can not win over informal recyclers until formal recycling become more cost efficient.

In India, 65 cities are generating about 65% of the e-waste. Top ten e-waste generating cities are Delhi, Bangalore, Ahmedabad, Mumbai, Chennai, Kolkata, Ahmedabad, Hyderabad, Surat, Pune, and Nagpur (Chatterjee, 2007).

India is not only generating its own e-waste, it's also getting lots of e-waste lands from the developed countries in the form of second hand goods (Toxics Link, 2004).

The major reason for this import are less strict environment laws and less cost of labor (Ragupathy, 2006). One of the major reason of e-waste of PC scrap was import in India (IRGSSA, 2004).

Research Gap and Research Problem:

Existing literature shows that the building blocks of rules and regulations related to effective e-Waste management is known in different countries but how many of these are applicable in India are not known.

This paper attempts to bridge this research gap.

Recognition of Variables

The following superset of variables, as shown in Table 3, was established from the literature survey that formed the building blocks of rules and regulation related to e-Waste management. The explanation of the variables are mentioned below:

- i) Illegal import: Adequate regulation to prevent the illegal import and export of e-waste is an important factor for effective e-waste management.
- ii) Safe disposal: Adequate regulation for safe disposal of e-waste is an important factor for effective e-waste management.
- iii) Working conditions of workers: Adequate regulation for workers involved in recycling is an important factor for effective e-waste management.
- iv) Restrict dumping: Adequate regulation to restrict unsafe dumping of e-waste is an important factor for effective e-waste management.
- v) Selling behaviors of e-Waste: Regulating the sale of e-waste will improve e-waste management

Table III: Variable identified from literature

Rules and Regulations	Illegal import (var1), Safe disposal (var2), Working conditions of workers (var3), Restrict dumping (var4), Selling behaviors of e-Waste (var5)	Rolf et al., 2005; Wen et al., 2006; Roa, 2007; Hanks et al., 2008; Susan et al., 2008
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Objectives of the Study:

To predict a model from the building blocks of rules and regulation related to e-waste management identified from literature.

Research question

What are the factors contributing to the effective rules and regulation related to e-waste management in India?

Research model

Based on the nature of the study and audience of the study quantitative model was used. The data is collected from the respondent by using questionnaire as an instrument, the collected data is analysed using WEKA datamining tool, To predict a model from the building blocks of rules and regulation related to e-waste management.

Research Methodology:

Based on the literature study related to rules and regulations required for effective e-waste management, factors were identified. On these variables a J48 classification algorithm is used to predict model for effective e-waste management related to rules and regulation. The result of the quantitative input is summarized. ***Sampling***

Convenience sampling was done from the higher education institutes and software companies located in Mumbai, NCR, Chennai, Bangalore, Uttarakhand and other part of India. A structured questionnaire was developed and responses from the Top managers, and Software developers of software industry were taken.

Data collection

Total 350 responses collected from the respondent among which few of them found incomplete. Incomplete questionnaires were not considered for analysis. Total 336 responses were found complete and considered for analysis. Cronbach's alpha test was used to test the validity and reliability of the questionnaire. Items having α value found greater than 0.7 (Hair et al., 2011)

Model for data analysis

The analysis of the collected data using classification algorithm of data mining was done on the software WEKA. The predictive model shown in Fig. 1 found that variable 1 and variable 4 value greater than 4 supported by 212 respondent.

DATA ANALYSIS AND RESULTS

Researcher has used a series of statistical tools and procedures to analyze the collected data. To develop an authentic e-Waste management measurement scale, researcher has made an assessment of the reliability of constructs. Finally, J48 classification algorithm were run to predict the model for rules and regulation related to e-waste management.

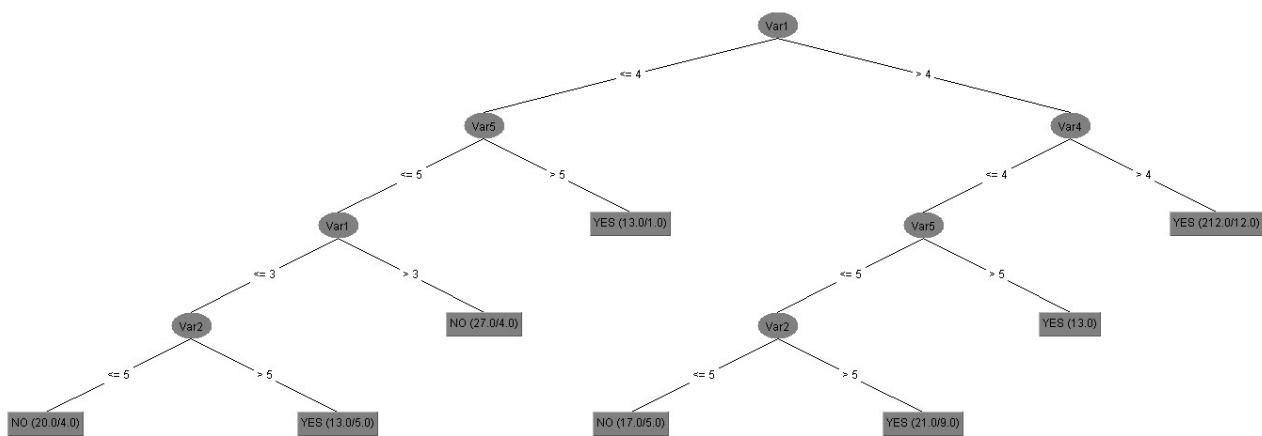


Figure I: Predictive model for rules and regulation

The model predict that when variable1(illegal import) and variable4 (restrict dumping) value greater than 4 (agree) then 212 respondent support or lead to effective e-waste management in the software industry of India.

Hence, the model predict that by developing or implementing rules and regulation which focus on to restrict illegal import of e-waste and restrict dumping of e-waste will lead to effective e-waste management.

There were five variables of rules and regulations related to e-Waste management in software industry among which two of them were accepted. Thus ‘illegal import’, and ‘restrict dumping’ are the predictor of effective e-Waste management. Three of the variables could not be supported in the study these are ‘Safe disposal’, ‘Working conditions of workers’ and ‘Initiatives’. The hypotheses ‘Collection and recycling’, ‘Awareness, and ‘Selling behaviors of e-Waste’ are not the predictor of effective e-Waste management.

CONCLUDING REMARKS

Existing literature shows that the building blocks of rules and regulations related to effective e-Waste management is known in different countries but how many of these are applicable in India are not known. This study was designed with an objective to predict the model for effective e-waste management based on factors identified from literature related to rules and regulations in Software industry. A total of 336 Software Developers of Software industry participated in the survey. A classification algorithm J48 was employed using WEKA and predictive model in the form of decision tree was developed. The model predict that when variable1(illegal import) and variable4 (restrict dumping) value greater than 4 (agree) then 212 respondent support or lead to effective e-waste management in the software industry of India. Hence, the

model predict that by developing or implementing rules and regulation which focus on to restrict illegal import of e-waste and restrict dumping of e-waste will lead to effective e-waste management.

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WORKING CAPITAL MANAGEMENT AND PROFITABILITY: A STUDY ON PHARMACEUTICAL INDUSTRY

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Abstract

Pharmaceutical industry plays a vital role in the development of Indian economy. This industry is research based and highly profitable. This paper analyses the effect of working capital management on firm's profitability in India for the period from 2013 to 2017. For this purpose, the data of eight pharmaceutical companies are used, which are listed in the National Stock Exchange (NSE) of India. Ratio analysis, Pearson's correlation and Ordinary Least Square regression models are used to establish the relationship between working capital management and firm's profitability. The study reveals that there is a positive relationship between working capital management and profitability.

Keywords: Working Capital Management, Average Collection Period, Return on Assets, Inventory Conversion Period, Average Payment Period, Cash Conversion Cycle, Pharmaceutical Companies, Profitability.

Introduction:

Finance is the life blood of an organization. So the management of finance is very much important. A finance manager in any organisation has three types of functions. These functions are (1) Investment Functions, (2) Financing Functions and (3) Dividend Functions. Investment function is divided into two parts (a) Capital budgeting and (b) Working Capital Management. The working capital management is very much important as it affects the profitability of the firm. A high level of working capital causes the wastage of resources while a low level of working capital damages the liquidity position of the organisation, which may increase the chances of bankruptcy. So there should be a proper balance between liquidity and profitability. So an optimum working capital management is necessary to increase the profitability of the firm.

A firm is required to maintain a proper balance between liquidity and profitability while doing day to day operations of the business. Liquidity is precondition to ensure that firms are able to meet their short term obligations and their continued flow can be guaranteed for a profitable venture (Padachi, 2006).

Like most corporate financial decisions, the decision on how much working capital be maintained involves a trade off because having a large net working capital may reduce the liquidity risk faced by firm, but it can have a negative effect on the cash flows. Therefore, the net effect on the value of the firm should be used to determine the optimal amount of working capital. Working capital management should maintain a proper balance of working capital components like receivables, cash, inventory and payables. Optimization of working capital means minimizing the working capital requirement and realizing maximum possible revenues (Ganesan, 2007). There is a strong relationship between the firm's profitability and its working capital efficiency (Shin, 1998).

A company wants to invest its more resources in fixed assets as compared to current assets because if we have more fixed assets, we will have more production, more sales and then more profits. On the contrary a company wants to take more borrowings from the short term liabilities in comparison to the long term liabilities because short term liabilities are less costly while long term liabilities are more costly. But if a company increase its current liabilities and decreases its current assets, then the company will be in the liquidity crises. As we can see in the table that profitability and liquidity have the negative relationship. If profitability increases, liquidity decreases and vice-versa (Table No-1). A well managed working capital promotes a company's well being on the market in terms of liquidity and it also acts in favour for the growth of shareholders value (Jeng-Ren, Li & Han-Wen,2006).

Table No -1

	Profitability	Liquidity	Risk
If Current Liabilities Increases	Higher	Lower	Higher
If Current Assets Increases	Lower	Higher	Lower

Table No 1 shows that for a given firm, if the level of current assets is increased (it impliedly means that the fixed assets will reduce by the same amount) then the liquidity position of the firm will also increase and it will be easily meeting its payment commitments. But simultaneously its profits and risk will decrease as the level of fixed assets has gone down. In other words, when the level of current assets is increased, the liquidity of the firm increases but there is always a cost associated with the increased liquidity. More and more funds will be blocked in current assets which are less profitable and therefore, the profitability of the firm will suffer.

Working capital management is vital especially for manufacturing and construction firms, where a major part of assets is composed of current assets (Horne & Wachowitz, 2000). The profitability liquidity trade-off is important because if working capital management is not given due considerations then the firms are

likely to fail and face bankruptcy (Kargar & Bluementhal, 1994). The main reason of failure of Lehman Brothers Bank in USA is also the poor working capital management. The bank was not able to convert its receivables into the cash. Every organisation whether relates to manufacturing sector, service sector or trading sector, irrespective of size and nature of business, requires necessary amount of working capital. Working capital is the most crucial factor for maintaining liquidity, survival, solvency and profitability of business (Mukhopadhyay, 2004). Working capital management is one of the most important areas while making the liquidity and profitability comparisons among firms (Eljelly, 2004), involving the decisions of the amount and composition of current assets and the financing of these assets. The higher the proportion of current assets, the lesser the probability of getting out of cash.

Every corporate strategy to be successful demands an efficient working capital management as it increases the shareholders' value. The risk of becoming technically insolvent is measured using Net Working Capital (NWC). It is measured that the greater the amount of NWC, the less risk prone the firm is. Or, the greater the NWC, the more liquid is the firm and, therefore, the less likely it is to become technically insolvent. The working capital fills the gap between the time when we purchase the raw material and the time when we collect payments from the receivables. The way of managing working capital can have a significant impact on both the liquidity and profitability of the firm (Shin & Soenen, 1998).

The pharmaceutical industry in India ranks 3rd in the world in terms of volume and 14th in terms of value. [Hyderabad](#), [Mumbai](#), [Bangalore](#), [Visakhapatnam](#) and [Ahmedabad](#) are the major pharmaceutical hubs of India. The domestic market was worth US\$13.8 billion in 2013. Most of the players in the market are small-to-medium enterprises; 250 of the largest companies control 70% of the Indian market. In terms of the global market, India currently holds a modest 1–2% share, but it has been growing at approximately 10% per year. India gained its foothold on the global scene with its innovatively engineered generic drugs and active pharmaceutical ingredients (API), and it is now seeking to become a major player in outsourced clinical research as well as contract manufacturing and research. The Indian pharmaceutical industry has become the third largest producer in the world and is poised to grow into an industry of \$35 billion in 2020 from the current turnover of \$20 billion. Exports from Indian pharmaceutical companies are also increasing. The main importing countries of Indian pharmaceutical companies are U.S.A., South Africa, Russia, U.K., Nigeria, Kenya, Tanzania, Brazil, Australia and Germany. These 10 countries imports 56.5% of India's total export ([www.worldsrichestcountries.com](#)).

The objective of this paper is to study the effect of working capital management on profitability. For the study the data of 8 pharmaceutical companies which are listed in the NSE have been taken for the 5 years from 2013 to 2017. Ratio analysis, Pearson's correlation and Ordinary Least Square regression models are used to establish the relationship between working capital management and firm's profitability.

Literature Review

Various researches have been done to analyse the relationship between working capital management and Profitability in India and abroad. But the results are quite mixed; some studies conclude that there are positive relationship between WCM and Profitability while some concludes the negative relationship. Eljelly (2004) examined the relationship by using correlation and regression analyses and found that the cash conversion cycle was of more importance as a measure of liquidity than the current ratio that affects profitability.

Thus according to the above study it can be said that cash as a current asset in the hands of the enterprise is desired more viz a viz other current assets as a measure of liquidity.

Gul, Khan, Rehman, Khan, Khan and Khan (2013) analysed the relationship of WCM on performance of small medium enterprises in Pakistan and found that APP, Growth and Size have a positive association with Profitability while ACP, CCC, DR and INV have negative relationship with profitability.

APP of small and medium enterprises is one of the decisive factors for further borrowings of the enterprise which in turn leads to growth with leverage thereby helping in further expansion.

Islam and Rehman (1994) conducted a study on WCM in Bangladesh and found that efficient WCM enables a firm to pay its liabilities on time. So in future if the firm require loans, it will get the loan on favourable conditions from the financial institutions.

The above study has the same interpretation as in the study of Gul, Khan, Rehman, Khan, Khan and Khan (2013).

Daniel Mogaka Makori and Ambrose Jagongo (2013) analysed the "Working capital management and firm profitability: Empirical Evidence from Manufacturing and Construction Firms Listed on Nairobi Securities Exchange, Kenya". For this purpose 5 manufacturing companies and 5 construction firms selected which are

listed on Nairobi Stock Exchange. 10 years data from 2003 to 2012 of these 10 companies have been taken. Pearson's correlation and Ordinary Least Squares regression analysis models are used to establish the relationship between WCM and profitability. The study finds a negative relationship between WCM and CCC and ACP, but a positive relationship between profitability and APP as well as financial leverage, sales growth, current ratio and firm size also have significant effects on the firm's profitability.

Working capital management is all about management of cash, inventory, receivables and payables. The longer CCC and ACP will have negative impact on WCM as it will reduce the cash liquidity of the enterprise.

Mohammad Morshedur Rahman (2011) conducted a study on "Working Capital Management and Profitability: A Study on Textiles Industry" in Bangladesh. For this purpose 9 textiles companies are selected and 3 years data have been analysed from the year 2005-06 to 2007-08. Ratio analysis, correlation matrix and regression analysis have been used to show the relationship between WCM and profitability.

It is observed from the study that correlation exists between WCM and profitability and it has a positive impact on profitability.

Ganesand (2007) concluded that efficient working capital management increases firm's free cash flow, which in turn increases the firm's growth opportunities and return to shareholders.

Free cash flow is desired for smooth functioning of the enterprise which in turn leads to further growth thereby increasing the shareholders' return.

Lazaridis and Tryfonidis (2006) analysed the relationship between WCM and corporate profitability of listed companies in the Athens Stock Exchange. The result of the study concludes that cash is the most important factor in the efficient WCM. A company can increase its profits and creates values to the shareholders by efficiently managing the cash conversion cycle (CCC). All the component of the CCC like account receivables, accounts payables and inventory should be at optimum level.

Optimum working capital is always desirable as it has a positive impact on the profitability of the enterprise.

Gill, Biger and Mathur (2010) conducted a study to find out the relationship between WCM and corporate profitability of listed companies in U.S.A. 88

american companies are selected which are listed on New York stock exchange and 3 years data have been taken from the year 2005 to 2007.

The results of the study concludes that there is a relationship between CCC and WCM. A company can increase its profits and creates values to the shareholders by handling correctly the CCC and by keeping accounts receivables at an optimum level.

Objectives of the Study

General Objective

The main objective of the study is to examine the relationship between working capital management and profitability in Pharmaceutical industry over a period of 5 years from 2013 to 2017.

Specific Objectives

The specific objectives of the study are as follows:

1. To determine whether there is a significant relationship between Average Collection Period (ACP) and Profitability of the firm.
2. To determine whether there is a significant relationship between Inventory Conversion Period (ICP) and Profitability of the firm.
3. To determine whether there is a significant relationship between Average Payment Period (APP) and Profitability of the firm.
4. To determine whether there is a significant relationship between Cash Conversion Cycle (CCC) and Profitability of the firm.

Research Hypotheses

1. Ho1: There is no significant relationship between Average Collection Period (ACP) and Profitability of the firm.
2. Ha1: There is significant relationship between Average Collection Period (ACP) and Profitability of the firm.
3. Ho2: There is no significant relationship between Inventory Conversion Period (ICP) and Profitability of the firm.
4. Ha2: There is significant relationship between Inventory Conversion Period (ICP) and Profitability of the firm.
5. Ho3: There is no significant relationship between Average Payment Period (APP) and Profitability of the firm.
6. Ha3: There is significant relationship between Average Payment Period (APP) and Profitability of the firm.
7. Ho4: There is no significant relationship between Cash Conversion Cycle (CCC) and Profitability of the firm.

8. Ha4: There is significant relationship between Cash Conversion Cycle (CCC) and Profitability of the firm.

Research Methodology

Sample for this study was collected from the 8 pharmaceutical firms listed on the National Stock Exchange of India for the period from 2013 to 2017. These eight firms are the top pharmaceutical companies of the country. The secondary time series data was obtained from their websites to find the link between profitability and liquidity. The annual reports of the selected pharmaceutical companies were considered. Thus a panel data of 40 firm year observation was obtained, with observation of 8 firms between 2013 to 2017. Extensive literature survey was done by analysing the old work. The collected data were analysed and interpreted with the help of different ratios, statistical tools, correlation coefficients and regression models.

Data and Variables

The variables of the study are given in table no 2. The average collection period (ACP); the inventory conversion period (ICP); the average payment period (APP); and the Cash Conversion Cycle are used as the independent variables and are considered for measuring working capital management. ACP is the time taken to collect cash from customers; ICP refers to the time taken to convert inventory held in the firm into sales; APP is the average payment period means time taken to pay the firm's creditors while CCC (Cash conversion cycle) is used as a comprehensive measure of working capital as it shows the time-lag between payment for the purchase of raw material and the collection of sales of finished goods. Apart from these variables, the size of the firm, the growth in its sales, firm leverage and current ratio are introduced as control variables. The reason for choosing these variables is that most of researchers (Deloof, 2003; Garcia-Teruel & Martinez-Solano, 2007; Jose *et al.*, 1996; Nazir & Afza, 2009; Raheman & Nasr, 2007; Huang *et al.* (2009); and Shin & Soenen, 1998) have used these to calculate the relationship between WCM and profitability in various markets. Table 2 below presents the variables, abbreviations and their measurements as used in the analysis.

Table No -2

Variable	Abbreviation	Measurement
Return on Assets	ROA	EBIT/ Total Assets *100
Average Collection Period	ACP	Accounts Receivable/ Net Sales *365

Inventory Conversion Period	ICP	Inventory/ Cost of Sales*365
Average Payment Period	APP	Accounts Payables/ Cost of Sales*365
Cash Conversion Cycle	CCC	ACP+ICP-APP
Sales Growth	GROWTH	(Sales _t -Sales _{t-1})/Sales _{t-1}
Debt Equity Ratio	DE	Debt/Equity
Current Ratio	CR	Current Assets/Current Liabilities
Firm Size	SIZE	Ln(Total Assets)

Statistical Tools and Techniques :

To analyse the working capital management and profitability following tools are used.

1. Descriptive analysis
2. Pearson Correlation and
3. Regression analysis.

The results are presented from quantitative data analysis using SPSS and MS-Excel.

Descriptive analysis

This analysis shows the mean, median, standard deviation, minimum and maximum of different variables of the study. By analysing minimum and maximum values of the variables, we are able to find out the minimum and maximum values the variable has achieved.

Table No - 3
Descriptive Statistics of Variables for Manufacturing Firms

Variable	Mean	Median	SD	Minimum	Maximum
ROA	196.17	154.91	148.2171	35.77	680.24
ACP	92.711	89.61	30.25158	51.34	168.98
ICP	78.1065	68.29	28.87771	32.73	138.25
APP	137.854	117.485	69.53266	47.37	324.41
CCC	32.9635	45.725	87.03967	-163.34	180.64
GROWTH	0.2545	0.21	0.328547	-0.08	1.84
D-E RATIO	0.20225	0.145	0.182806	0.01	0.84

CR	1.846	1.775	0.638808	0.53	3.51
SIZE	8.97625	9.01	0.645194	7.85	10.53

The mean value of return of assets (ROA) is 196.17% with the median of 154.91% which is quite high in pharmaceutical industry. The minimum value is 35.77% and maximum value is 680.24% with a standard deviation of 148.21. The mean average collection period (ACP) of the firms are 92.71 days with a standard deviation of 30.25 days which means receivables taking 92.71 days credit from the firms.

On an average firms take 78.10 days to convert inventory into sales with a standard deviation of 28.87 days. On an average firm is getting 137.85 days credit from their suppliers. This credit period is quite high with a maximum of 324.41 days. Cash conversion cycles of the firms are 32.96 days with the maximum cycle of 180.64 days. Average growths of the firms are 25.45% with median growth of 21%. So it is a growing industry. The debt equity ratio of the firms are 0.20:1 with the standard deviation of 0.18:1. The average current ratio of the firms are 1.84:1 with the maximum of 3.51:1, so the firms are able to pay its short term liabilities on time. The average firm size of 8.97625 as measured by the natural logarithm of its total assets.

Pearson Correlation Analysis

Table no -4 shows the Pearson correlations among the different variables.

Table No - 4
Pearson Bivariate Correlation Coefficients

	ROA	ACP	ICP	APP	CCC	GROWTH	D-E RATIO	CR	SIZE
ROA	1								
ACP	0.654	1.000							
ICP	-0.138	-0.130	1.000						
APP	-0.217	0.237	-0.552	1.000					
CCC	0.355	0.115	0.728	-0.900	1.000				
GROWTH	0.127	-0.222	-0.072	0.327	-0.363	1.000			

D-E RATIO	0.083	0.003	-0.266	0.149	-0.206	-0.024	1.000		
CR	0.088	0.210	0.164	-0.286	0.356	-0.281	-0.585	1.000	
SIZE	0.244	0.130	0.025	-0.015	0.065	0.156	-0.039	0.232	1

The table no 4 shows that Return on Assets (ROA) is positively correlated with ACP, CCC, GROWTH, D-E ratio, CR and size of the firm. The positive relationship between ROA and ACP states that firms are using liberal credit policy to increase the sales so that some customers who cannot buy goods on cash or strict credit policy can also purchase goods, which increase the sales as well as profits of the company. The positive relationship between ROA and CCC states that higher investment in receivables increases the sales and higher investments in inventory reduces the cost of stock out, so sales as well as profits increases. The positive relationship between ROA and Growth states that firms with higher growths are able to earn higher profits. The positive relationship between ROA and D-E ratio means that firms are able to increase the earnings of the company by using the leverage. The positive relationship between ROA and CR states that firms with high current ratio (high level of cash, receivable and inventory) are financially sound in short term and are able to pay its liabilities on time so suppliers are ready to provide goods on credit to the firms, so there is no interruptions in the flow of goods which increase the sales as well as earnings of the firms. The ROA and size of the firm have positive relationship which may be due to larger firm's ability to exploit the economics of scale.

The ROA is negatively correlated with ICP and APP. The negative correlation between ROA and ICP states the firms are having higher investments in stock but are not using it efficiently are the cause of decrease in profits. The ROA is negatively correlation with APP which state that if firms will take larger credit periods from suppliers, they will provide goods at higher prices which will result in decrease in profits.

Regression

Table No -5
Regression Results

Dependent Variable : Return on Assets (ROA)

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	(-)533.009 (.100)	(-)603.338 (.140)	(-)568.262 (.169)	(-)533.487 (.174)	97.100 (.711)
ACP	2.999 (.000)				3.897 (.000)
ICP		(-).725 (.394)			(-) 1.963 (.002)
APP			(-)348 (.347)		(-)1.426 (.000)

CCC				.555 (.068)	
GROWTH	3.351 (.957)	186.585 (.553)	(-)19.298 (.809)	5.450 (.944)	
D-E RATIO	113.851 (.401)	186.585 (.278)	221.550 (.188)	228.431 (.160)	(-) 33.324 (.745)
CR	20.397 (.627)	68.830 (.180)	61.174 (.237)	47.653 (.344)	(-) 48.802 (.138)
SIZE	43.399 (.175)	78.316 (.048)	73.476 (.063)	64.150 (.095)	20.561 (.387)
ADJUSTED R²	0.386	0.037	0.042	0.109	0.666
F- Value	5.909 (.000)	1.303 (.286)	1.341 (.271)	1.959 (.110)	13.989 (.000)
D-W Statistics	0.956	0.847	0.761	0.702	1.267
Firm Years	40	40	40	40	40

Model no 1 tests the hypothesis that there is no significant relationship between ACP and profitability. The regression results indicate that the coefficient of ACP is positive. Thus Ho1 is rejected and is concluded that ACP is significant. It suggests that liberal credit policy increase the sales as well as profits of the firms. The model's adjusted R² implies that 38.6% of the variation in the profitability of the firms can be explained by the model. The other variables in the model are also significant. Growth, D-E ratio, CR and size all positively related with return on assets.

Model no 2 tests the hypothesis that there is no significant relationship between ICP and profitability. The regression results indicate that the coefficient of ICP is negative. Thus Ho2 is not rejected and is concluded that ICP is not significant. It suggests that for higher profits firm should have more inventory. The model's adjusted R² implies that 3.7% of the variation in the profitability of the firms can be explained by the model. The other variables in the model are also significant. Growth, D-E ratio, CR and size all positively related with return on assets.

Model no 3 tests the hypothesis that there is no significant relationship between APP and profitability. The regression results indicate that the coefficient of APP is negative. Thus Ho3 is not rejected and is concluded that APP is not significant. It suggests that faster payment to creditors increase the profits of the firms. By paying early firms can get price discounts and profits of the firms will increase. The model's adjusted R² implies that 4.2% of the variation in the profitability of the firms can be explained by the model. The other variables in the model are also significant. Except Growth, D-E ratio, CR and size all positively related with return on assets.

Model no 4 tests the hypothesis that there is no significant relationship between CCP and profitability. The regression results indicate that the coefficient of

CCP is positive. Thus Ho4 is not rejected and is concluded that CCP is not significant. It suggests that liberal credit policy and faster payment to creditors increases the profits of the firms. The model's adjusted R² implies that 10.96% of the variation in the profitability of the firms can be explained by the model. The other variables in the model are also significant. Growth, D-E ratio, CR and size all positively related with return on assets.

Model 5 acts as the control model for the variables under study. The model was run so as to find out the most significant variables affecting the study. In the model ICP, CCC, D-E Ratio and CR are negatively related with the firm's profitability while Size is positively related with the profitability. The model's R² is 66.6% with an F value of 13.989 which is highly significant.

Conclusion

Every business concern should have adequate working capital to run its business operations. It should have either redundant or excess working capital nor inadequate or shortage of working capital. Both excess as well as shortage of working capital situations are bad for any business. However, out of the two, inadequacy or shortage of working capital is more dangerous from the point of view of the firm. The purpose of working capital management is to manage the firm's current assets and current liabilities in such a way that a satisfactory level of working capital is maintained. This is so because if the firm cannot maintain a satisfactory level of working capital, it is likely to become insolvent and may even be forced into bankruptcy.

Most of the pharmaceutical firms have large amounts of cash reserves in their working capital. By the optimum investment in Accounts Receivables and Inventory, firms can increase their profitability. Firms should also pay accounts payables on time to get price discounts which will also add in the profitability.

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