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STUDY THE DIVERSIFICATION STRATEGY OF INDIAN CONSTRUCTION INDUSTRY

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ABSTRACT
Diversification could be an option for failing firms to apply existing resources and/or knowledge into the production of other products or industries. But due to any wrong assessment of diversification decision the firms could face difficult to sustain its existence. The focus of this study is to identify & ranking the factors influencing decision to diversify, factors influencing decision not to diversify, post diversification experience. The research also analyzed the difference between 'growth' of core/undiversified, moderately & highly diversified construction firms and impacts of diversification on 'performance' of construction firms in India. 'Growth' & 'performance', these two variables were measured by 'net profit margin' & 'return on equity' respectively. The data was collected from 17 respondents of 11 construction firms across India & considered financial year 2008 to 2017. To analyze the study, three research methods i.e. Relative Importance Index (RII), Kruskal-wallis & descriptive statistical method were used to analyze the data. This paper also suggested some recommendations as lots of scope of future research is present in this field.

Keywords: Diversification, Undiversified, Moderately & highly diversified, Growth, Performance, Net Profit Margin, Return on Equity

INTRODUCTION

Diversification strategy is a form of growth strategy which helps the organizational business to grow. It opens up new possibilities for the organization. By adopting this strategy, the organization not only diversifies its products offerings in the target markets but also expands its business horizons. The strategy helps the organization to increase sales volume and revenues while keeping costs to minimum. Diversion strategy is associated with higher risks as it requires the organization to take on new experience and knowledge outside its existing markets and products. The organization may come across issues that it has never faced before. It may need additional investment or skills. On the other hand, however, it provides the opportunities to explore new avenues of business. This can spread the risk allowing the organization to move into new and potentially profitable areas of operation. Perhaps the most basic reason of diversification is survival.

In the present scenario of dynamic construction Indian markets and strong competition, a successful instrument of risk management is to avoid focusing on a single product, service and/or their distribution to a single limited market. When implemented wisely diversification strategy contributes to keeping the organization stable even in hard times since the economic downturn usually occurs simultaneously in construction industry.

In Indian construction industry those firms adopting diversification strategy, either concentric or conglomerate, they can be called as 'diversified' firms. But simultaneously other firms are not interested to diversify their business due to several reasons. They can be called as 'core or undiversified' firms.

Therefore, contractors or consultants need to make strategic decisions regarding diversification of the business in respect of:

- Whether diversify or not to diversify.
- Risk factors in diversification.
- Post diversification experiences of the same or other firms
- Comparisons between undiversified & diversified firms in terms of growth

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OBJECTIVE OF THE STUDY

The main objectives of this study were as follows,

- Factors influencing decision to diversify in Indian construction industry
- Factors influencing decision not to diversify in Indian construction industry
- Post diversification experience of diversification
- Comparisons on the basics of 'growth' & 'performance' between undiversified, moderately diversified & highly diversified firms

LITERATURE REVIEW

Ofori and Chan (2000) identified diversification as one of three business growth paths (apart from concentration and acquisition). There appears to be two schools of thought on the subject of diversification strategy as it relates to financial performance and growth of a firm; industrial organization and strategic management group (Palepu, 1985).Azhar Kazmi (2010) defines in his book "Strategic Management & Business Policy", 3rd edition, p-157, when new products are made for new markets then diversification takes place.

Reasons of Diversification

Miller (2004) suggests that diversification could be an option for failing firms in the sense that a diversifying firm can apply existing resources and/or knowledge into the production of other products or industries.

Pawaskar (1999) concludes in his study that diversification, which could be through internal capacity expansion or external expansion by merger and acquisition, is essentially a means of growth. The combining of resources creates new competitive strengths and capabilities (BCG, 2006).

Conditions for successful diversification

Two critical factors have been highlighted to affect a firm's success. One is initial conditions, noted by Levinthal and Myatt (1994), and the other is the importance of core competencies and strategic assets (Markides and Williamson, 1996).Core competencies are the pool of experience, knowledge and systems, etc. that exists elsewhere in the same corporation and can be deployed to reduce the cost or time required to either create a new strategic asset or expand the stock of an existing one (Markides and Williamson, 1994). Mukherji (1998) conclude that industries with prior high performance tend to have successful diversification & asserts that the most important factor in diversification is the strategic relatedness between assets and competencies and the ability to create and sustain competitive advantage through these two. According to Duhaime and Stimpert (1994), other variables influence performance and growth in a diversified firm, such as industry profit levels, expenditure on research and development, capital outlay and efficiency levels.

Risks and Rewards of Diversification as a Strategy

The corporate managers bring both a cost to the combined organizations as well as the opportunity to manage the combined resources of the different businesses (Wan, 2010). According to Collins & Montgomery (2005), a more meaningful approach is to analyse the costs (risks) and benefits (rewards) under the strategies of related and unrelated diversification.

Hoechle et al. (2009) argues that the major advantages of related diversification are that it leads to operational synergies, which in turn develop into long-term competitive advantage.

The Boston Consulting Group (BCG) (2006), have noted that business risk is scattered over a set of diverse industries and one can spread risk by spreading businesses with totally different technologies, competitive forces, market features and customer bases.

Diversification- Performance Relationship

Some studies have shown that diversification improves profitability over time citing a positive relationship (Yan et al., 2010; Hoskisson & Peng, 2005; Wan, 2011), whereas others have demonstrated negative relationship and that diversification decreases performance (Ozbas & Scharsfstein, 2010). Still others have shown that diversification and performance linkage depends on business cycle. Santalo and Becerra (2004) explain conceptually and provide empirical evidence that no relationship exists (positive, negative or even quadratic) between diversification and firm performance.

Measure of Firm Performance and Growth

This study is limited to the calculations and analyses of return on equity (ROE) and net profit margin (NPM). These ratios measure a firm's use of its assets and control of its expenses to generate an acceptable rate of return. These measures have been employed by researchers such as Ibrahim and Kaka (2007), among others to assess firm performance.

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ROE: This is the ratio of net income (income available to common stockholders) to stockholders equity. It is a measure of company performance from the viewpoint of shareholders. It is essential in the calculation of the ROE to use the profit for ordinary shareholders, which is the profit after tax and after interest charges (Weetman, 2003). It is expressed as:

$$ROE = \frac{\text{Profit after tax}}{\text{Share Capital + Reserves}} \times 100\% \quad \text{(weetman)}$$

PM: This ratio is also called operating profit margin. It is the ratio of profit after interest and tax (PBIT) to total revenue. It is calculated as:

$$PM\,(net) = \frac{\text{Profit after tax}}{\text{Total revenue}} \times 100\% \quad \text{(ACCA, 2008)}$$

RESEARCH METHODOLOGY

Sample Size & Data Collection

Several surveys were conducted to reach the solution of the study objective. 17 respondents pertaining experience from five to fifteen years, from 11 construction firms, head office based at Mumbai, Delhi, Ahmadabad and Hyderabad were randomly selected for the study.

Data was collected for the study in two ways; primary data collected through the distribution of questionnaires via electronic mails, telephonic discussions, personnel meetings. Primary data included questionnaire survey regarding factors influencing decision to diversify in Indian construction industry, factors influencing decision not to diversify in Indian construction industry, post diversification experience of diversification.

Secondary data collected in the form of ten years audited financial statements from the given 11 firms, financial websites etc. Secondary data included: average (arithmetic mean) of net profit margin (%) & return on equity (%) of last 10years & 8 years respectively.

Data Analysis

Several methods were applied to conclude the objectives. Relative Importance Index (RII) method for ranking of factors & post diversification experience, Kruskal-wallis test for the analysis of three samples here as core/undiversified, moderately & highly diversified firms based on 'net profit margin' & descriptive statistical tools like standard deviation & coefficient of variance to define variability (risk) & risk per unit return based on 'return on equity' respectively.

Categorization of Samples

There was a need to further categorize in order to successfully undertake this study which set out to examine the relationships between diversification strategies and financial performance and growth among established Indian contracting firms.

Here researchers defined 4 categories of Civil works. as follows,

Building works (BW), Transportation works (TW), Water & Irrigation works (WI) & Industrial Works (IW).

BW- residential, commercial building

TW- roads, port, airport, railway, metro

WI- water supply & treatment, irrigation

IW- civil, mechanical, electrical works in steel plant, cement plant, thermal & hydro power plants, oil refinery, different factories & pipe line.

The table below summarizes the criteria for further categorization of the firms.

Table 1: Diversification categories of Construction industry

Category	Diversification Classification
Firms presence in business sector of Building works (BW)+Transportation works (TW)+Water-Irrigation works (IW) or only Transportation works (either only roads construction or all)	Core or Undiversified
Above mentioned (row 1) + <= 2 Industrial works (IW)	Moderately Diversified
Above mentioned (row 1) + > 2 Industrial works (IW)	Highly Diversified

Sample Design

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A sample is defined by Cooper and Schindler (2008) as part of the target population, carefully selected to represent that population. The basic idea of sampling is that by selecting some of the elements in a population, we may draw conclusions about the entire population. Here stratified sampling method is implemented as divided the population into three sub-groups or strata namely core oriented/undiversified, moderately diversified & highly diversified.

Hypothesis

In the words of Leedy and Ormrod (2005), a hypothesis is a logical supposition, a reasonable guess or an educated conjecture. It is a speculation on how the study will turn out. The following are the four hypotheses tested in this study;

Hypothesis 1 (H1): Growth of core/undiversified, moderately & highly diversified firms is same.

Hypothesis 2 (H2): As diversification increase in Indian construction industry, firms (undiversified, moderately & highly diversified) perform always better.

DATA ANALYSIS

Relative Importance Index (RII) Method for ranking the factors

Factors influencing decision to diversify

17 respondents randomly selected from 11 construction firms, employed in the department like contract, business development & pertaining experience from 5 to 15 years. Total 13,8,12 factors were chosen for factors influencing decision to diversify, factors influencing decision not to diversify & post diversification experience respectively. The respondents were asked to give their perceptions using a five-point likert scale (from 1 for 'very less important', 2 for less important, 3 for moderate important, 4 for high important and 5 for very high important). The Relative Importance Index (RII) was calculated in Microsoft Excel using the following equation (Naoum, 1998)

$$\text{Relative Importance Index} = \frac{\sum w}{AN} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{5N}$$

W = is the weight given to each factor by the respondents and ranges from 1 to 5.

n1 = number of respondents for 'very less important', n5 = number of respondents for 'very high important'

A = is the highest weight (i.e. 5 in this case) and;

N = is the total number of respondents. (Here total number of respondents 17 Numbers)]

13 factors were analysed using RII Method and ranked as shown in Table 2.

Table 2: Factors influencing decision to diversify

Sl. No.	Factors	RII	Rank
1	The need to spread risk – risk aversion	0.929	1
2	Present market is saturated – stiff competition	0.905	2
3	Need for growth (increase turnover and profit)	0.870	3
4	Need to engage unutilized resources (human, technical and financial)	0.858	4
5	Attracted to more profitable business(es)	0.858	4
6	"Bandwagon effect" – others are doing it	0.800	5
7	Cyclical/fluctuating demand in present market	0.776	6
8	Existing business face resistance	0.765	7
9	Diversified companies appear to be doing better than us	0.753	8
10	Improve the stability/survival of the company	0.729	9
11	Hope to enjoy economy of scope – build synergies in asset utilization	0.706	10
12	Hope to enjoy economy of scale through operational efficiencies	0.706	10
13	Desire to create a monopoly in the market	0.671	11

Factors influencing decision not to diversify (undiversified firms)

Table 3: Factors influencing decision not to diversify

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Sl. No.	Factors	RII	Rank
1	Satisfied with the present level of growth	0.941	1
2	Insufficient knowledge of other types of business	0.918	2
3	Consider diversification process too difficult/involving	0.906	3
4	Inadequate resources (human, technical and financial)	0.894	4
5	Present market not saturated – more opportunities exit here	0.882	5
6	High cost involved in diversification	0.871	6
7	Prefer to be focused and specialized in present business	0.847	7
8	Diversified companies are not doing better than us	0.836	8

Post diversification experience (diversified firms)

Table 4: Post diversification experience

Sl. No.	Factors	RII	Rank
1	The company experienced steady growth in sale (turnover) volume	0.941	1
2	There was a steady growth in overall profitability	0.929	2
3	Asset turnover for the company increased	0.918	3
4	Improvement in the utilization of resources(human, technical and financial) was realised	0.905	4
5	A boost in the corporate image of the company was achieved	0.882	5
6	The company achieved an edge over competitors in terms of practicing R&D, innovation & new industrial technologies	0.870	6
7	The company's management structure had changed	0.858	7
8	More professionals and skilled staff had employed	0.800	8
9	At a point, the company had to divest its interest in some business to refocus its operation – due to failure in such business	0.765	9
10	Company didn't enjoy economy of scope –build synergies in asset utilisation	0.753	10
11	It was not possible to achieve economy of scale because of production type – usually 16ustomized products	0.729	11
12	Unable to create a monopoly in the market	0.718	12

Hypothesis Testing

Hypothesis 1 (H1)

Null hypothesis, H_O: Growth of core/undiversified, moderately & highly diversified firms is same.

Alternative hypothesis, H_A: Growth of core/undiversified, moderately & highly diversified firms is different or at least two of these firms' growth is different.

Now based on table 1, net profit margin (%) of the 11 sample firms from FY 2008 to 2017 are given below,

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Table 5: company's Net Profit Margin (%), source- annual report of the firms

Diversification type	Company's name	Year									
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Core or undiversified	Ashoka Buildcon Ltd	6.76	6.44	6.78	7.09	7.81	6.24	6.65	7.23	8.23	9.0
	Patel engg ltd	11.1	9.77	5.4	4.03	2.37	1.59	0.92	0.48	-0.71	1.43
	C&C Construction	7.67	5.48	6.91	4.03	-6.27	-19.42	-6.01	-18.74	-2.51	3.66
	Sadbhav engg	5.87	5.97	10.6	5.41	5.25	4.09	4.5	3.83	4.2	5.66
Moderately diversified	Madhucon projects	6.4	4.57	3.49	1.89	1.93	3.23	3.67	4.34	3.53	2.26
	IVRCL	5.75	4.63	3.85	2.79	0.29	-2.7	-16.65	-21.56	-44.9	-6.43
	Ramky infrastructure	4.86	4.66	5.52	5.76	4.64	1.97	-24.62	-41.26	0.69	3.75
Highly diversified	Reliance infrastructure	17.04	8.02	11.65	11.31	10.17	13.96	13.98	14.55	19.94	14.69
	Larsen & toubro	8.74	8.35	11.93	9.01	8.38	9.51	9.71	8.87	8.89	8.3
	Tata projects	1.65	-1.92	2.56	3.25	2.78	2.12	2.66	3.62	1.42	1.85
	HCC	3.53	-0.78	-14.38	1.74	-5.57	-3.59	1.99	2.97	2.1	4.37

Now, from the above mentioned table of arithmetic mean of NPM (%) of the sample firms' are found out as given below,

Table 6: Mean (arithmetic mean) of NPM (%) for the sample firms

Diversification type	Year									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Core or undiversified	7.85	6.92	7.17	5.14	2.29	-1.88	1.52	-1.8	2.30	4.94
Moderately diversified	5.67	4.62	4.29	3.48	2.28	0.83	-12.53	-19.49	-13.56	-0.14
Highly diversified	7.74	3.42	2.94	6.33	3.94	5.5	7.08	7.5	8.08	7.3

'Kruskal-Wallis Test' was conducted on these set of data, at 5% level of significance ($\alpha=0.05$).The three samples are combined (pooled) into on large sample on the basics of table 6.Then we determined the rank of each observation in the pooled sample as lowest value receiving a rank 1 & highest value receiving maximum rank.

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Table 7: Kruskal-Wallis raking table

Average Net Profit Margin(NPM)	Firms	Rank
-19.49	M	1
-13.56	M	2
-12.53	M	3
-1.88	C	4
-1.80	C	5
-0.14	M	6
0.83	M	7
1.52	C	8
2.28	M	9
2.29	C	10
2.30	C	11
2.94	H	12
3.42	H	13
3.48	M	14
3.94	H	15
4.29	M	16
4.62	M	17
4.94	C	18
5.14	C	19
5.50	H	20
5.67	M	21
6.33	H	22
6.92	C	23
7.08	H	24
7.17	C	25
7.30	H	26
7.50	H	27
7.74	H	28
7.85	C	29
8.08	H	30

[M=Moderately diversified, C= Core or undiversified, H= Highly diversified]

Total ranks of 'highly diversified' firms, $r_1 = 217$

Total ranks of 'moderately diversified' firms, $r_2 = 95$

Total ranks of 'core/undiversified' firms, $r_3 = 152$

Therefore,

$$H = \frac{12}{n(n+1)} \sum_{i=1}^{k} \frac{r_i^2}{n_i} - 3(n+1)$$

H= 9.22

We know that H follows a χ^2 distribution with 2 degree of freedom.

From χ^2 table, at α=0.05

$\chi^2_{critical\,(table)}$ value = 5.991

$\chi^2_{calculated}$ value = 9.22

So, $\chi^2_{calculated} > \chi^2_{critical}$

So, reject null hypothesis (H_O) & accept alternative hypothesis (H_A)

So, Growth of core/undiversified, moderately & highly diversified firms is different or at least two of these firms' growth is different.

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Hypothesis 2 (H2)

Null hypothesis, H_O: If diversification increases in Indian construction industry, firms perform always better.

Alternative hypothesis, H_A: If diversification increases, firm doesn't perform always better.

Here 'performance' was measured by Return on Equity (ROE).data collected from 9 firms' FY 2010 to 2017 annual report, are given below

Table 8: Company's Return on Equity (%) (2010-2017)

Diversification type	Company's name	Year							
		2010	2011	2012	2013	2014	2015	2016	2017
Core or undiversified	Ashoka Buildcon Ltd	18.69	12.18	13.37	11.96	11.09	13.49	9.49	9.87
	Patel engg ltd	10.18	7.66	4.27	3.38	1.55	0.7	-1.11	1.92
	Sadbhav engg	47.25	19.11	18.44	8.9	11.37	8.41	9.09	11.31
Moderately diversified	Madhucon projects	7.92	5.33	5.41	5.00	4.49	6.63	3.29	2.00
	IVRCL	11.42	7.96	0.8	-4.69	-49.52	-59.31	-236.92	-33.47
	Ramky infrastructure	24.11	17.7	14.86	5.84	-72.63	-213.65	5.6	20.33
Highly diversified	Reliance infrastructure	8.18	6.29	11.02	10.36	7.78	7.41	9.33	6.13
	Larsen & toubro	24.34	18.14	17.68	16.86	16.33	13.64	13.05	11.85
	HCC	-7.04	4.66	-17.16	-11.84	6.46	5.88	4.56	4.26

From this data table arithmetic mean of ROE, standard deviation, coefficient of variance calculated for all three type diversified firms as given below in table 9.

We know, standard deviation:

$$S = \sqrt{\frac{\Sigma(X - \overline{X})^2}{N}}$$

$$\text{Coefficient of variance (C.V)} = \frac{\text{Standard Deviation (S.D)}}{\text{Average return on equity i.e. AROE}}$$

Table 9: descriptive statistics data of three type diversified firms

Diversification type	Number of firms	AROE	Standard Deviation(S.D)	Coefficient of variance (C.V)
Undiversified	3	10.94	2.75	0.25
Moderately diversified	3	-21.73	51.44	NA
Highly diversified	3	7.84	7.93	1.01

Here, S.D = variability of AROE i.e. risk on AROE

C.V = risk per unit return

So, AROE undiversified firms > AROE highly diversified firms > AROE moderately diversified firms

S.D moderately diversified firms > S.D highly diversified firms > S.D undiversified firms

C.V highly diversified firms > C.V undiversified firms

So, 'highly diversified' firms with compare to 'core or undiversified' firms had:

- Less return on equity (AROE)

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- High variability on AROE (S.D) & high risk per unit return (C.V)

So, reject null hypothesis (H$_O$) & accept alternative hypothesis (H$_A$)

So, we can say, if diversification increases, firm doesn't perform always better.

Graphical representation

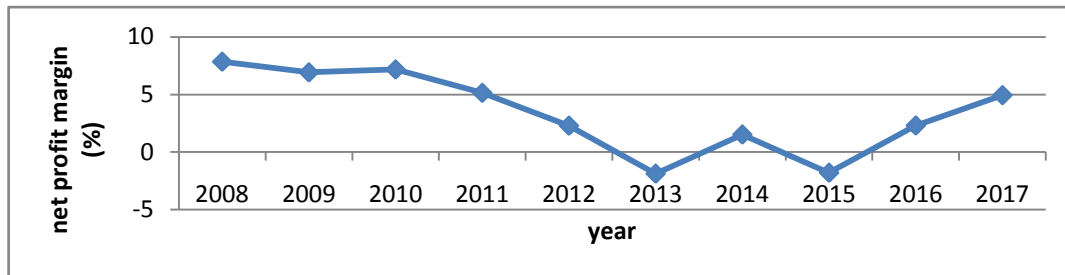From table 6, the below mentioned graphical pictures presented of three category firms of the study.
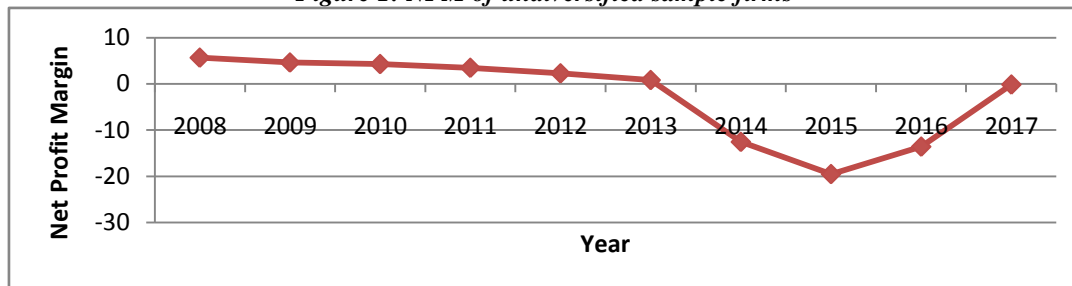

Figure 1: NPM of undiversified sample firms

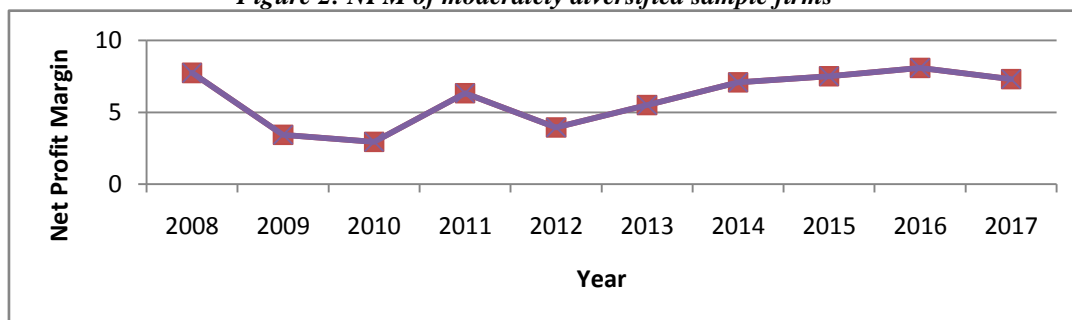*Figure 2: NPM of moderately diversified sample firms*

Figure 3: NPM of highly diversified sample firms

From table 6, Average Net Profit Margin of sample firms are given below table.

Table 10: Average NPM of sample firms

Average NPM of core/undiversified sample firms	2.46%
Average NPM of moderately diversified sample firms	-4.36%
Average NPM of highly diversified sample firms	6.08%

Now, from table 8, Average Return on Equity (AROE) of sample firms are given below table.

Table 11: AROE of sample firms

AROE of three core/undiversified sample firms	10.94%
AROE of three moderately diversified sample firms	-21.73%
AROE of three highly diversified sample firms	7.84%

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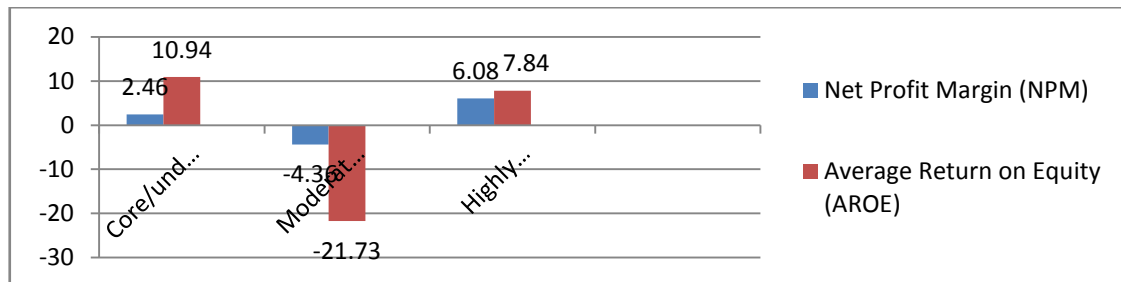

Figure 4: Average NPM & AROE of three different diversified firms from 2010-2017

CONCLUSION & RECOMMENDATION

- Spread risk, attracted to more profitable business, stiff competition & fluctuating demand plays major influence role to diversify decision by the Indian construction firms.
- Undiversified firms are not interested to diversify the business mainly due to satisfied with present growth, more existing opportunities in present business, high cost involve in diversification & preference to be specialized in present business.
- The study concludes that Indian diversified construction firms experience steady growth & profitability, proper resources utilization, boost in corporate image, and achieve edge over competitors after adopting diversification in terms of practicing R&D, innovation & new industrial technologies.
- From hypothesis 1 it is concluded that growth of core/undiversified, moderately & highly diversified firms is different or at least two of these firms' growth is different.
- From hypothesis 2, it is concluded that 'highly diversified' firms with compare to 'core or undiversified' firms had:
  - Less return on equity (AROE)
  - High variability on AROE (S.D) & high risk per unit return (C.V)

So, we can say, if diversification increases, firm doesn't perform always better in terms of ROE i.e. 'performance' according to this study.

Recommendation

- It would be beneficial to the industry and body of knowledge if this study could be replicated with larger sample firms, probably in another province in India in order to establish a better understanding of the subject area and test the reliability of the study's findings.
- Further study should be carried out on the subject of diversification, firm performance and growth in the construction industry during the period of financial recession, to see if there is an impact of recession on the strategy and performance of contracting firms.
- An area that further study could be directed is difference in performance between related and unrelated diversifiers in the construction industry.
- Further research should look into developing a model that explains the diversification-performance-growth relationships in the construction industry in particular. Researchers in other industries have different and sometimes conflicting conclusions on the subject.

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