

An Evaluation of DuPont Model for Indian Software and Networking Companies



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Information Technology (IT) consulting software and networking companies are considered to analyze the characteristics of different groups of Indian IT companies and to ascertain the patterns of the Return on Equity (ROE) for Indian IT companies using the DuPont model. We calculated return on equity using three factors DuPont model. The study shows that DuPont Model is significant for Indian IT consulting software and networking companies. Further we found that there is a significant relationship between ROE, asset run over and profit margin. We found that five factors DuPont model can be used to measure the performance of other sectors companies.

Keywords: DuPont Analysis, ROE, Profit Margin, Asset Turn over Ratios, Equity Multiplier

1. Introduction

The economic development of the country depends on the development of adequate infrastructure facilities. The country's growth and development has inter-linkages with many sectors. All the sectors require facilities from the information technology (IT) companies for the development infrastructure. The reformation of liberalization, privatization and globalization initiated by the Government of India has led to the development of many sectors in general and IT companies in particular. The reformation has focused on improvement of infrastructure, technology know how, software development, software enabled services etc. IT Companies are essential for development of the country's economy. In India, this sector has been mostly financed, operated and maintained by the private enterprises. Finance for IT companies can come from government and non-government sources. The non-government sources of financing for IT companies include private sector, local self-governments, private institutions, religious institutions, trusts, general public, high net-worth individuals. The effective utilisation of the finance will be reflected on the growth of IT companies. Hence, it is necessary to analyze the sources and utilisation of finance in Indian IT companies. Therefore, assessing the financial performance of the information technology companies will help us to understand how we are creating value for the money spent for development of this sector. There are various methods that are used in analyzing financial statements, such as comparative statements, schedule of changes in working capital, common size percentages, funds analysis, trend analysis and financial ratios analysis. Many researchers in developed countries have debated on the method of financial statement analyses. The research on financial performance analysis has been undertaken by Beaver (1977), Bird and McHugh (1977), Foster (1978), Garcia (1994). Therefore analysts can obtain useful information by analyzing company's recent financial statements and comparing the results with other companies. Making meaningful comparisons may not be possible only with traditional financial ratios. Hence novel technique of financial statement analysis is required for widely diversified companies. One of the novel techniques is DuPont analyses where investors and owners can see a comprehensive picture of firm performance. F. Donaldson Brown was the founder of the DuPont equation in 1914. This model provides the comparison of return in similar firms using Return on Equity (ROE). The mechanism of DuPont equation measure ROE with three components such as profit margin, asset turnover and financial leverage. In this model firm Profit margin describes working efficiency, asset turnover describe utilization of asset and financial leverage describe equity multiplier. This research focuses on assessing the performance of companies' profitability. The studies conducted by Warker (1971) found that DuPont helps the top management to take appropriate decision. Osteryoung *et.al* (1992) found that the Return on Assets (ROA) and Return on Equity (ROE) are important for understanding the profitability of a business enterprise. Hawawini and Viallet (1999) offered modification to the DuPont model resulted in five different ratios that combine to form ROE. Lilach (2002) observed that major sources of competitive performance are the firm-specific advantage. Cinca *et.al.* (2005) proved that the size of the company and the country where the company is located impact the financial ratio structure. Hongquan (2011) claimed that neither traditional nor improved DuPont financial indicators have significant incremental information content in predicting the company's future earnings. Kabajeh *et.al* (2012) revealed a positive relationship between ROA, ROE, return on investment and market price of shares. Rogova (2014) found that a strong advantage of ROE indicating profitability and efficiency from the shareholders' point of view. Research on financial statement analysis in Indian context has been debated by Pandey (1995), Bhalla (2001) found that DuPont equation can be used for Indian companies of various sectors. Kumar (2000) found that the sales of the Hindustan Motors Ltd were showing an upward trend which reflected a growth in its profit. Karthikeyan (2000) forecasted the financial performance by using cross-section regression analysis. Alam (2001) suggest that the monthly variance of material used, labour costs and overheads expenditure should be prepared to control cost and improve profitability. Van Horne *et.al* (2002) shown that dividend and liquidity management in Indian context. Sahu (2002) revealed the effective management of liquidity in the Indian paper companies. Singh (2002) observed that working capital management of Lupin Laboratories Ltd working position was satisfactory which improved the debt collection policy.

Shanmugam *et al.* (2003) analysed growth of the Indian manufacturing companies using regression analysis. Chandra (2008) discussed on the concepts financial decisions-investment, financing, dividend and liquidity management in Indian context. Mittal (2011) conclude that the main variables determining structure of industries in India are agency costs, assets structure, non-debt tax shield and size. The paper is organized in four parts. Part 1 is the introduction; Part 2 presents objectives, and methodology; Part 3 analyses the results; Part 4 presents the summary and conclusions. References are given after Part 4.

2. Objectives and Methodology

2.1 We have set following objectives based on the evidence Fairfield and Yohn (2001), Ross *et al.*, (1996).

- To apply and analyze DuPont Model for Indian IT consulting software and networking companies.
- To analyze whether the performance of IT companies differs over a period of time

2.2 Hypotheses: Based on the available evidence on Nanavathi (2013) and Tiwari and Parray (2012) the following null hypotheses are formulated

- **H₀:** Three factors and five factors DuPont model is not significant for the Indian IT companies.
- **H₀:** There is no significant difference in the performance of companies over different time periods.

Negations of above hypothesis are alternate hypothesis. We propose to test the above hypotheses in the Indian context by taking the data and sample described below.

2.3 Data Sample & Methodology

This study proposes to apply and analyze DuPont Model for Indian IT consulting software and networking companies. Lermack (2003) analyzed benefits of financial ratios analysis. Santany *et al.* (2003) observed that degree of current asset in positive associated with the operating profitability of the firm. Lasher (2005) found that requires financial data of the companies. This data would be collected using the different corporate databases Powell and Stark (2005) shows that significant improvements in operating performance. This study was based on the forty six IT companies in India. For the study purpose we have taken Ten years financial statement viz 2007,2008,2009,2010,2011,2012,2013, 2014, 2015 and 2016 of 46 IT companies. The annual data of the selected companies is obtained from the Capital Line Database. We have adopted methodology as done by Moyer *et al.*, (2007), and Ross *et al.*, (2008). To test the hypothesis we used Panel data regression in R Studio. We calculated ROE using following model.

Three Step DuPont Analysis Model

$$\text{ROE} = (\text{Net Profit Margin} \times \text{Asset Turnover}) \times (\text{Equity Multiplier}) \quad (1)$$

We have applied 5 factors DuPont Analysis for the Calculation of ROE.

Extended DuPont Analysis Model

$$\text{ROE} = (\text{Tax Burden}) \times (\text{Interest Burden}) \times (\text{Operating Margin}) \times (\text{Asset Turnover}) \times (\text{Equity Multiplier}) \quad (1)$$

3. Results and Analysis

The study and analyze DuPont Model for Indian IT consulting software and networking companies. Further to analyze whether the performance of IT companies differs over a period of time. Therefore, we have analysed ten years data of selected companies for the study period. Main findings of the study are discussed in the following paragraphs.

Table 1 shows that return on equity (ROE) of the Software and Networking companies. ROE of Infosys is ranges from 0.24 to 0.36; AGC Networks ranges from -1.55 to 0.22; Zensar Tech ranges from 0.22 to 0.29; Empower India ranges from -0.15 to 0.08; Wipro ranges from 0.19 to 0.3; Sterling Intl ranges from 0.01 to 0.14; VamaInds ranges from 0.02 to 0.05; Innovation soft ranges from -2.61 to 0.23; Onward Technology ranges from -0.59 to 0.31; Mphasis ranges from 0.06 to 0.41; ASM Technologies ranges from 0.17 to 0.41; Info-Drive software ranges from 0.0 to 0.11; Aurum Soft ranges from -3.44 to 0.22; Sparc systems ranges from -0.19 to 0.02; Goldstone Tech ranges from -0.07 to 0.23; Starcom Info ranges from -3.31 to 0.43; Cat Tech ranges from -0.04 to 0.35; Cyient ranges from 0.09 to 0.24; Sonata Software ranges from 0.05 to 0.33; Accelya Kale ranges from 0.1 to 1.09; HCL Technologies ranges from 0.2 to 0.38; Geometric ranges from 0.06 to 0.23; IZMO ranges from -0.01 to 0.09; Commex Tech ranges from -0.28 to 0.08; Dynacons Sys ranges from 0.01 to 0.07; Ramco systems ranges from -0.22 to 0.14; KPIT Tech ranges from 0.12 to 0.37; Oracle Fin.serv ranges from 0.14 to 0.35; TCS ranges from 0.35 to 0.47; NIIT Tech ranges from 0.14 to 0.37; 3i infotech ranges from -2.51 to 4.21; Sasken Comm. Tec ranges from 0.06 to 0.42; FCS Software ranges from -0.09 to 0.24; R S Software ranges from 0.04 to 0.44; Tech Mahindra ranges from 0.07 to 0.52; Mind tree ranges from 0.06 to 0.32; Quintegra Soln ranges from -0.32 to 2.17; Allied Digital ranges from -11.3 to 104.23; Take solutions ranges from 0.04 to 0.17; GSS Info ranges from -0.82 ranges from 0.25; SQS India BFSI ranges from 0.03 to 0.38; Infinite Comp ranges from 0.11 to 0.29; Persistent Sys ranges from 0.15 to 0.25; Bharatiya Global Info media ranges from 0.0 to 0.15; Gemini Comm ranges from -8.03 to 0.36; Smart Link Network ranges from -0.01 to 0.86. We found that increase in the operating Income profit margin and asset turn over it reflects positively on the return on equity.

Table 1 Return on equity of Indian Software and Networking Companies using DuPont Model

ROE	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Infosys	0.34	0.33	0.33	0.26	0.26	0.28	0.25	0.24	0.25	0.28
AGC Networks	0.22	0.08	0.07	0.13	0.05	0.06	-0.1	-1.55	0	-0.51
Zensar Tech	0.2	0.22	0.24	0.29	0.24	0.23	0.24	0.29	0.24	0.25
Empower India	0.08	0.05	0.00	0.00	0.00	0.00	-0.02	-0.15	0.00	0.00
Wipro	0.3	0.26	0.24	0.28	0.23	0.19	0.23	0.25	0.24	0.2
Sterling Intl	0.14	0.14	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
VamaInds	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.02	0.05	0.02
Innovation Soft	-0.17	0.11	0.03	0.23	0.08	-0.01	-0.68	-0.14	-0.09	-2.61
Onward Technology	0.01	-0.01	-0.59	-0.24	0.19	0.31	0.11	0.14	0.04	0.03
Mphasis	0.16	0.19	0.27	0.41	0.34	0.23	0.17	0.15	0.06	0.14
ASM Technologies	0.21	0.41	0.31	0.23	0.32	0.28	0.27	0.24	0.17	0.24
Info-Drive Software	0.05	0.06	0.11	0.13	0.02	0.01	0.01	0	0.02	0
Aurum Soft	0.22	0.19	0.01	-0.03	0.03	0.01	0	-0.19	0	-3.44
Sparc Systems	0.02	0	0	-0.01	0	0	-0.11	-0.06	-0.19	-0.04
Goldstone Tech	0.23	0.18	0.02	0.01	0.02	0.03	0.03	0.02	-0.07	-0.02
Starcom Info	0	0.02	-0.02	0.03	0.04	0.05	-0.31	0.17	-3.31	0.43
Cat Tech	0.35	0.03	0.07	0	0	-0.01	-0.02	-0.03	-0.03	-0.04
Cyient	0.24	0.09	0.1	0.16	0.13	0.15	0.16	0.18	0.17	0.14
Sonata Software	0.2	0.18	0.24	0.21	0.2	0.05	0.05	0.17	0.33	0.33
Accelya Kale	0.12	0.2	0.11	0.17	0.1	0.3	0.93	1.09	0.8	0.85
HCL Technologies	0.32	0.24	0.29	0.21	0.2	0.3	0.36	0.38	0.33	0.22
Geometric	0.16	0.1	0.23	0.06	0.1	0.2	0.14	0.18	0.2	0.21
IZMO	0.09	0.03	0.01	0.01	0.01	0.01	0	0	0	-0.01
Commex Tech	-0.28	-0.12	-0.26	0.04	0.03	0.05	0.08	0.03	0	-0.02
Dynacons Sys	0.01	0.01	0.01	0.05	0.05	0.07	0.03	0.04	0.04	0.05
Ramco Systems	-0.22	0.14	-0.01	-0.01	0.03	-0.02	-0.13	-0.15	0.01	0.04
KPIT Tech	0.24	0.23	0.37	0.2	0.12	0.12	0.12	0.16	0.15	0.17
Oracle Fin.Serv	0.15	0.15	0.2	0.16	0.19	0.17	0.14	0.14	0.35	0.31
TCS	0.47	0.41	0.35	0.37	0.39	0.44	0.39	0.42	0.42	0.39
NIIT Tech	0.37	0.37	0.29	0.2	0.21	0.18	0.22	0.22	0.14	0.17
3i infotech	0.14	0.16	0.25	-0.11	0.11	-0.32	-0.25	-0.74	4.21	-2.51
SaskenComm.Tec	0.09	0.06	0.06	0.16	0.22	0.09	0.1	0.16	0.36	0.42
FCS Software	0.24	0.01	-0.01	0	-0.01	0	-0.09	0.01	0	0
R S Software	0.25	0.06	0.26	0.31	0.44	0.32	0.3	0.31	0.3	0.04
Tech Mahindra	0.07	0.27	0.52	0.26	0.21	0.13	0.16	0.31	0.2	0.24
Mind tree	0.21	0.2	0.06	0.32	0.16	0.23	0.26	0.27	0.27	0.25
QuintegraSoln	0.07	0.07	-0.32	-0.27	2.17	0.44	0.15	0.03	0.08	0.01
Allied Digital	104.23	11.84	30.83	59.29	4.31	0.4	-11.3	19.12	-0.54	-0.53
Take Solutions	0.17	0.08	0.05	0.04	0.09	0.12	0.12	0.05	0.04	0.06
GSS Info	0.25	0.1	0.13	0.05	0.02	-0.07	-0.02	0.01	-0.82	0.03
SQS India BFSI	0.38	0.31	0.32	0.12	0.03	0.13	0.21	0.27	0.22	0.36
Infinite Comp	0.11	0.15	0.29	0.17	0.12	0.25	0.24	0.13	0.19	0.16
Persistent Sys	0.23	0.25	0.15	0.18	0.18	0.16	0.18	0.21	0.19	0.17
Bharatiya Global info media	0.13	0.14	0	0.1	0.15	0.01	0.01	0.01	0	0.01
Gemini Comm	0.36	0.29	0.01	0.08	0.08	0.02	-0.01	-8.03	1.3	0.11
Smart link Netwr	0.12	0.14	0.05	0.11	0.1	0.86	0.01	-0.01	0.03	0.01

Table 2 shows the regression analysis of IT consulting software and networking companies for the year 2007 to 2016. sig value is statistically significant hence we reject the null hypothesis and accept the alternate hypothesis that three factors DuPont model is significant for the Indian IT companies and also five factors DuPont model is significant for the Indian IT companies. The results of this are conforming the study undertaken by Mihaela et.al (2010), Nissim(2001), Francis (2013).

Table 3 shows the panel data regression analysis of IT consulting software and networking companies for the year 2007 to 2016. We have conducted panel data regression in R studio as mentioned in the methodology to test the hypothesis. The R

Value is 0.450 and 0.452 which indicates a low degree of correlation with the dependent variable for both the DuPont three and five Factor analysis respectively. We have conducted a p Ftest in R studio and we have calculated the p value and it is less than 0.05 hence we are rejecting the null hypothesis and we are accepting the alternate hypothesis that there is a significant difference in the performance of IT companies over different time periods.

Table 2 Regression Analysis of IT software and networking companies from 2007-2016

DuPont 3 Factor		DuPont 5 Factor		DuPont 3 Factor		DuPont 5 Factor	
R	R Square	R	R Square	F	Sig.	F	Sig.
.450	.202	.452	.204	38.562	.000	35.282	.002

Table 3 Panel Data Regression analysis of IT Software and Networking Companies from 2007-2016

DuPont 3 Factor		DuPont 5 Factor		DuPont 3 Factor		DuPont 5 Factor	
R	R Square	R	R Square	F	P	F	P
.450	.197	.452	.196	38.562	0.0027	23.314	0.0031

4. Summary and Conclusion

This paper has attempted to analyse DuPont model for Indian consulting software and networking companies and further to analyze whether the performance of IT companies differs over a period of time. The overall conclusions of this study are summarized as follows

- The analysis of return on equity shows that increase in the operating income margin and asset turn over it reflects positively on the return on equity. Hence we reject the null hypothesis and accept the alternate hypothesis that three factors DuPont model is significant for the Indian IT companies and also five factors DuPont model is significant for the Indian IT companies.
- Panel data regression analysis of IT consulting software and networking companies shows P value is less than 0.05 Hence we are rejecting the null hypothesis and we are accepting the alternate hypothesis that there is a significant difference in the performance of IT companies over different time periods.

For future research direction, researchers can employ the five step DuPont model in other industries to see if it can explain the total variation in ROE as it has in the Indian Information Technology companies.

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