The Impact Of Dividend Policy On Shareholders' Wealth Evidence From Industry And Technology Sector In India

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Abstract

Dividend Policy (DP) is considered to be one of the major decisions of financial management. The decision of the firm regarding how much earnings could be paid as dividend, and how much could be retained by the firm is the concern of DP. The DPdetermines the extent to which the earnings paid to shareholders by way of dividends, and theextent to which the earnings ploughed back in the firm itself for reinvestment purposes. The development of such a DP will be greatly influenced by investment opportunities available to the firm, and the value of dividends as against capital gain to the shareholders. Each firm should develop such a DP, which divides the net earnings into dividends, and retained earnings is an optimum way to achieve the objective of maximizing the shareholders' wealth (SW). Hence, the objective of the paper is to analyze the impact of DP on SW of **Industry and Technology Sector** in India. Out of 13 firms in Industrial and 17 firms in Technology sector listed onBombay Stock Exchange (BSE), 6 firms each that have been paying dividend consecutively for thepast ten years are considered for analysis. Besides descriptive statistics, Augmented Dickey Fuller Test (ADF), Levin, Lin & Chu (LLC) t test, Philip Perron (PP) Fisher   test, Im-Pesaran- Shin W (IPS-W) and Breitung test are used to test whether the data are stationary and to satisfy one pre-condition for co-integration Johansen Co-integration test is used. Regression and Chow test are also applied to differentiate the impact between pre and post financial melt down periods. The results of the co-integration test reveals that the presence of a long-run relationship between DP and SW in Industry sector and there is no co-integration between DP and SW inTechnology Sector in India. Regression result proves that DP has significant impact on SW and the Chow test result proves that the impact of DP (significantly affected by the variables DPS and DY) onSW has been affected by the financial melt down for **Industry Sector** in India and the impact of DP onSW is unaffected by the financial meltdown for **Technology sector** in India.

Key words: Dividend policy, Shareholders' wealth, Financial melt down

1. INTRODUCTION

In an ever-increasing Indian economy, globalization, liberalization and privatization together with rapid strides made by information technology have brought intense competitionin every field of activity. So, the Indian firms at present are dazed, confused and apprehensive. To maintain the competitiveness and value addition to the firms, today'sfinance managers have to make critical business and financial decision which will lead to long-run perspective with the objective of maximizing the shareholders' wealth **(**SW).

The principal financial objective of any business enterprise is to maximize the shareholders' wealth (SW). The corporate function of maximizing SW assumes that managers operate in the best interests of the shareholders. Therefore, it takes place when the returns to the shareholders' on to the investment are maximized.   In addition, these returns are made up of capital gains in the form of increase in the share prices, as well as dividends, which are made possible when the firm generates adequate distributable profits.

SW is represented by market price of the firms' common stock, which in turn, is the function of the firms' investment, financing and dividend decision. The modern approach of financial management provides a conceptual and analytical framework for decision making, which emphasizes the effective use of resources to create SW. The optimal dividend policy (DP) is one that maximizes the firms' stock price; this leads to maximization of SW and thereby ensures rapid economic growth.

Therefore, the present study is aimed at to study the long-run relationship between theDP and the SW, and the impact of DP on SW before and after an event viz.,- the global financial melt down.

2. REVIEW OF LITERATURE

Researchers have propounded many theories about the firm's value as well as the SW. Profitability of the firm has long been regarded as the main indicator of the firm's DP. There has been substantial literature on the relationship between the DP and SW and the impact of DP on SW. Several studies were made in respect of determinants of DP and SW in the developed as well as in the developing economics like India.

Azhagaiah and Veeramuthu (2010), in a research paper titled "The impact of firm size on dividend behavior: A study with reference to corporate firms across industries in India"

examined the association between corporate leverage and DP of the firms across industries in India. The study was conducted on a panel data of 73 firms for a period from 1996 to 2007. The impact of leverage on DP was studied using multiple regression technique and Chow test(Chow, 1960**)**. The study proved that there was a significant influence of predictor variables on the DP of small size firms, medium size firms and large size firms and overall corporate firms across industries in India.

Okpara (2010), in a research paper titled "Asymmetric information and dividend policy in emerging markets: Empirical evidence from Nigeria" employed the unit root test, Dickey fuller test, Johansen co-integration and Vector error correction model to ascertain the long-run relationship between the selected dividend variables. Granger causality tests showed that DP had casual impact on information asymmetry without a reverse or feedback effect. The study investigated the long-run effect of the dichotomy of information on DP and the DP was found to have significant and positive function with information asymmetry.

Vijayakumar (2011), in a study titled "Economic value added and shareholders' wealth creation: A factor analytic approach" considered a sample of 20 automobile firms for the period from 1996-97 to 2008-09. Statistical tools like mean, standard deviation, variance, range, skewness and kurtosis showed inconsistent results with EVA's behaviour. The measures like turnover, return on sales (ROS), return on total assets (ROTA), return on capital employed (ROCE), earnings per share (EPS), market price per share (MPS) and market value added (MVA) were used for analysis. The study found that sales and profit aftertax had strong relationship with economic value added.

Rafique (2012), in a study titled "Factors affecting dividend payout: Evidence from listed non-financial firms of Karachi stock exchange" considered a sample of 53 non-financial firms listed on the Karachi Stock Exchange for the period of 2005-10. The study found that corporate tax and firms' size had significant relationship with DP, whereas earnings (EAR), growth (GR), profitability (P) and financial leverage (FL) were found to have insignificant relationship with DP in the context of Pakistani stock market.

Arif and Akbar (2013), in a research paper titled "Determinants of dividend policy: A sectoral analysis from Pakistan" considered a sample of 174 non-financial firms listed on Karachi Stock Exchange for the period from 2005 to 2010. The important determinants identified in the study are: profitability (P), size, tax, investment opportunities and life cycle stage of firm. The study analyzed the relationship of variables firstly for overall non-financial

sector and after for sub sectors of non-financial sector. Over all sector analysis was performed through panel data analysis. Further, to check sectoral differences, step-wise regression analysis was performed and the results of the study showed that profitability (P), tax, size and investment opportunities were the most influencing determinants of DP.

Iqbal et al. (2014), in a study titled "Impact of dividend policy on shareholders' wealth: A study of selected manufacturing industries of Pakistan" considered a sample of 35 firms, which were randomly selected from three sectors viz., textile, sugar and chemical for the period from 2006 to 2011. Market capitalization was used as response variable while DPS, firm growth and firm size were considered as predictor variables. Ordinary least square (OLS) regression was used to study the impact of DP on SW. The study found that the DP, firm size and firm growth had significant positive impact on SW.

Tahir and Raja (2014), in their study titled "Impact of dividend policy on shareholders' wealth" studied oil and gas exploration firms of Pakistan during the years from1999 to 2006 using statistical tools like regression and correlation to ascertain the best fitted model for the impact of DP on SW. The variables viz., dividend payout ratio (DPR), price earnings ratio (PER) and book value to market value of equity (BV/MV) ratio were considered as predictor variables while holding period yield as response variable. The result indicated correlation between predictor variables and response variable; however the relationship was very low for all the firms. Oil and gas industry of Pakistan paid dividend on regular basis however there was uncertainty in the stock market due to which holding period returns were not efficient as share price of firms was not stable; dividend payout hadinsignificant relationship with holding period yield.

The above literature provides a review of impact of DP on SW. The previous studies, by and large, were attempted to study the long-run and short-run relationship between DP andSW and the impact of DP on SW. In the present study, an attempt has been made to estimate the difference in the impact of DP on SW between pre and post financial melt down periods.

3. STATEMENT OF THE PROBLEM
Previous researchers have propounded many theories on DP as well as on SW. Thus, the researchers are puzzled by the question, "whether SW was affected by DP? for many years. In the literature, there are different views regarding whether DP affects firm's share price in the long-run. Some studies showed that the firm's value was not influenced by DP

(Toby, 2014; and Baker Collins et al. 2007) while some others showed that DP affectedfirm's value DeAngelo and Skinner (2004). So, the present study has made an attempt to study the difference in the impact of DP on SW between pre and post financial meltdown periods of the selected firms of **Industry and Technology sector** in India.

4. RESEARCH QUESTIONS

The research proposes to seek answers to the following questions:

1. Whether long-run relationship exists between dividend policy and shareholders' wealth of listed firms of **Industry and Technology** Sector during the study period.
2. How do the dividend variables along with financial variables influence the shareholders' wealth of **Industry and Technology** Sector?
3. How do finance variables (after removing dividend variables) influence the shareholders' wealth of the **Industry and Technology** Sector in India?
4. How does dividend policy impact shareholders' wealth before and after financialmeltdown of **Industry and Technology** Sector in India?

5. OBJECTIVES OF THE STUDY

1. To study the long-run relationship between dividend per share, dividend payout as well as dividend yield and shareholders' wealth of the **Industry and Technology**Sector in India.
2. To estimate the impact of dividend variables along with finance variables on shareholders' wealth of the **Industry and Technology** Sector in India.
3. To estimate the influence of finance factors on shareholders' wealth of the **Industry and Technology** Sector in India.
4. To study the difference in the impact of dividend policy on shareholders' wealth of

   Industry and Technology Sector between pre and post financial melt down periods.

6. HYPOTHESES DEVELOPED FOR THE STUDY

➢ $H_0 1$:"There is no co-integration between dividend per share and shareholders' wealth".

➢ $H_0 2$:"There is no co-integration between dividend payout and shareholders' wealth".

➢ $H0^3$: "There is no co-integration between dividend yield and shareholders' wealth".

- $H_0{}^4$:"There is no significant impact of dividend policy on shareholders' wealth".

- $H_0{}^5$: "There is no significant difference in the impact of dividend per share on shareholders' wealth between pre and post financial meltdown periods".

- $H_0{}^6$: "There is no significant difference in the impact of dividend payout on shareholders' wealth between pre and post financial meltdown periods".

- $H_0{}^7$:"There is no significant difference in the impact of dividend yield on shareholders' wealth between pre and post financial meltdown periods".

7. RESEARCH METHODOLOGY

7.1. Data Source and Period of the Study

The study used secondary data, which are collected from the capital market data base called Centre for Monitoring Indian Economy Private Limited (Prowess CMIE) for a period of 10 years on year to year basis from 2003-04 to 2012-13.

7.2. Sampling Procedure and Technique

The study used **multi-stage non-random sampling technique**

Table-1- List of Firms Selected for the Study (Based on listed firms in BSE 200) forthe Study Period 2003-04 – 2012-13

Total No. ofFirms (1)	Dividend non-paying firms (2)	Adequate Data not available inthe data source (3)	Total number of firms not considered for thestudy (4) = (2+3)	Ultimate sample firms selected for the study (5) =(1) - (4)
Industry 13 Technology 17	Industry 6 Technology 10	Industry 1 Technology 1	Industry 7 Technology 11	Industry 6 Technology 6

Source: Compiled data collected from PROWESS database provided by CMIE

Table 1 shows the number of firms of **Industry and Technology Sector** listed in Bombay stock exchange (30), out of which dividend non-paying firms (16), and firms for which adequate data were not in the data source (2) are eliminated, hence the ultimate number of sample firms considered for the study is 12 only.

7.3. Research Methods

Besides various dividend variables and finance factors, statistical methods viz., Augmented Dickey Fuller Test, Johansen Co-integration, Ordinary Least Square method and Chow test are applied for analysis of data using Eviews 7 Econometrics software package.

7.4. Ratios used for Analysis

The study used two important ratios viz., dividend related ratios and shareholders' wealthrelated ratios and details of the ratios used for analysis are shown in table-2.

Table-2- Dividend variables (DPS, DPO and DY) used to estimate the impact of DP on SW(MPS)

Sl. No.	Classification ofDividend Ratios	Variables	Description	Inference
I	Dividend relatedratios	1. Dividend per share (DPS)	Dividend / Numberof equity shares outstanding	The DPS reveals how well earnings support the dividend payout.
		2. Dividend payout ratio (DPO)	Dividend per share /Earnings per share	The DPO provides an idea as to how well earnings support the dividend payment. Mature firmstend to have a higher payout ratio,while low dividend payout ratioenables the firm to keep a large portion of its earnings for its future growth.
		3. Dividend yield (DY)	Dividend per share /Market price per share	The DY shows how much a firm pays out as dividend each year relative to its share price. Higher dividend yield has been considered to be desirable formost investors. A high share pricewill lead to low dividend yield and vice versa.

				High market price reflects that thefirms are in very good position and low market price reflects reverse.
II	Shareholders'wealth (SW) related ratio	1. Market priceper share (MPS)	Market capitalization / Number of equityshares outstanding	

Source: www.scibd.com/essays/finance.php

Source:www.ukessays.com/essays/finance/current-assets-current-liability.php

Table-2 shows the variables used to study the relationship between DP and SW and to analyze the impact of DP on SW before and after financial melt down. Market price per share(MPS) is considered as proxy response variable for shareholders' wealth (SW), while dividend per share (DPS), dividend payout (DPO), and dividend yield (DY) are considered aspredictor dividend variables.

Besides, the study also used finance variables viz., return on capital employed (R_CE), return on net worth (R_NW), return on assets (ROA), return on long-term fund (R_LF), return on equity (ROE), total debt to equity (TD_EQ), total debt to total assets (TD_TA), total debt to fixed assets (TD_FA), equity multiplier (EM), proprietary ratio (PR),

total liabilities to net worth (TL_NW), current ratio (CR), quick ratio (QR), earnings pershare (EPS), price earnings ratio (PER), working capital to total assets (WC_TA), current assets to total assets (CA_TA), net fixed assets to net worth (NFA_NW) are also considered as predictor variables to study the impact of DP on SW.

For the analysis of pooled data for ten years i.e. from 2003-04 to 2012-13 the following research methods are used.

 ➢ Descriptive Statistics (Jarque-Bera test)

 ➢ Augmented Dickey Fuller Test, Levin, Lin & Chu (LLC) t test (2002), Philip Perron (PP) Fisher test (1988), Im-Pesaran-Shin W test (IPS-W)(2003) and Breitung test (2000)

 ➢ Johansen Co-integration test (Johansen and Juselius, 1990 and Osterwald-Lenum, 1992)

 ➢ Ordinary Least Square Method of Regression and

 ➢ Chow test (1960)

8. RELATIONSHIP BETWEEN DP AND SW: ANALYSIS AND DISCUSSION
Industry Sector

Test of normality

Table 3 presents the mean, standard deviation, skewness and kurtosis along with JB test for MPS, DPS, DY, DPO and EPS of six firms under **Industry sector**. From standard deviation, it is found that the MPS for most of the firms is highly dispersed from the central tendency (mean) (standard deviation is high) for majority of the firms under **Industry sector**. The fact that the MPS is positively skewed for majority of the (five) firms states that the MPSdata are symmetrical. The MPS is moderately skewed for four firms viz., Bosch, Crompton Greaves, Siemens and Voltas. The JB test statistics for MPS data are insignificant for all the six firms under **Industry sector**, which led to accept the null hypothesis that the data are normally distributed i.e. the MPS of six firms under **Industry sector** are normally distributed.

For DPS, skewness lies between -0.50 and + 0.50 for most of the firms under **Industrysector**, which reveals that the DPS data are approximately symmetric. The kurtosis < 3 for two firms viz., Siemens and Voltas and it is > 3 for three firms viz., Crompton Greaves, Havells India and Hindustan Zinc. The JB test statistics are not significant for five firms, which confirms the presence of normality in the DPS of firms under **Industry sector**. Similarly, the JB test value > critical value of   at 5 per cent level, for all the firms for EPS as well as DPO, respectively.

Table 3 Descriptive and Jarque-Bera Normality Test Statistics for Market Price per Share and Dividend / Earning Variables for Firms under Industry Sector during 2003 – 04 to 2012 – 13

Company Name	Mean	SD	Skewness	Kurtosis	Jarque Bera Value	Jarque Bera p Level
Market Price per Share (MPS)						
Bosch	5312.5	2352.5	0.57	1.97	0.98	0.6131
Crompton Greaves	289.64	171.96	1.01	3.07	1.71	0.4254
Havells India	386.26	148.82	-0.22	1.94	0.55	0.7592
Hindustan Zinc	449.73	366.85	0.44	1.71	1.02	0.6006
Siemens	1119.5	781.25	1.32	3.72	3.14	0.2085
Voltas	204.6	147.71	1.33	3.01	2.93	0.2306
Dividend Per Share (DPS)						
Bosch	3.6	3.83	1.92	5.65	9.04**	0.0109
Crompton Greaves	0.76	0.17	1.21	3.05	2.42	0.2977
Havells India	0.7	0.38	1.36	3.17	3.1	0.2121
Hindustan Zinc	0.58	0.45	1.19	3.24	2.4	0.3013
Siemens	2.24	0.77	-0.39	1.9	0.76	0.6831
Voltas	1.26	0.62	-0.32	1.68	0.89	0.6393
Dividend Yield (DY)						
Bosch	0.07	0.05	1.66	5.56	7.33*	0.0256
Crompton Greaves	0.35	0.18	0.26	2	0.53	0.7671
Havells India	0.19	0.08	0.08	1.67	0.75	0.6869
Hindustan Zinc	0.3	0.42	1.56	3.64	4.21	0.1218
Siemens	0.29	0.2	0.34	1.68	0.91	0.6331
Voltas	0.86	0.58	-0.02	1.37	1.11	0.5741
Dividend Payout (DPO)						
Bosch	1.51	1.09	1.25	4.78	3.94	0.1397
Crompton Greaves	7.61	3.39	0.03	1.51	0.93	0.6294
Havells India	3.09	1.58	1.36	3.13	3.1	0.2123
Hindustan Zinc	2.94	4.01	1.49	3.47	3.78	0.1514
Siemens	8.62	5.22	0.24	1.58	0.94	0.6258
Voltas	17.43	8.74	-0.26	1.62	0.91	0.6359
Earning Per Share (EPS)						
Bosch	262.5	153.45	1.06	3.46	1.97	0.3731
Crompton Greaves	11.81	5.65	1.36	4.07	3.54	0.1701
Havells India	22.82	4.25	-0.1	2.03	0.41	0.8144
Hindustan Zinc	48.22	39.79	0.21	1.31	1.27	0.5309
Siemens	32.43	15.79	1.44	4.33	4.2	0.1222
Voltas	7.84	3.36	0.65	2.56	0.79	0.6724

Source: Computed from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.
** Significant at 1% level; * Significant at 5% level.

In the case DY, the normality violation is rejected for majority of the firms (5 out of 6), henceit is concluded that the MPS, DY, DPO and EPS are normally distributed for most of the firms under Industry sector.

Unit Root Test

Table 3.1 Unit Root Test (Panel) Results for Market Price per Share and DividendVariables for Firms under Industry Sector

Method	No Intercept No Trend				Intercept No Trend				Intercept and Trend			
	Level		First Difference		Level		First Difference		Level		First Difference	
	Statistic	p Value	Statistic	p Value	Statistic	p Value	Statistic	p Value	Statistic	p Value	Statistic	p Value
Market Price per Share (MPS)												
Levin, Lin & Chu t (LLC)	0.1	0.5404	-8.59**	0	-1.79*	0.037	-9.35**	0	-11**	0	-11.76**	0
Breitung t-stat									0.45	0.6724	-2.9**	0.0019
IPS W-stat					-0.64	0.2603	-4.72**	0	-2.91**	0.0018	-3.53**	0.0002
ADF - Fisher Chi-square	10	0.6157	70.69**	0	14.63	0.2625	45.66**	0	41.41**	0	48.55**	0
PP - Fisher Chi-square	10.75	0.5508	53.85**	0	12.38	0.4155	32.97**	0.001	32.02**	0.0014	25.02*	0.0147
Dividend per Share (DPS)												
Levin, Lin & Chu t (LLC)	1.58	0.9426	-5.16**	0	0.09	0.5363	-5.69**	0	-2*	0.0228	-6.28**	0
Breitung t-stat									1.54	0.9382	-1.17	0.1212
IPS W-stat					2.47	0.9933	-3.34**	0.0004	0.35	0.6368	-1.34	0.0904
ADF - Fisher Chi-square	2.41	0.9985	46.22**	0	9.21	0.6845	35.98**	0.0003	14.01	0.3003	28.83**	0.0042
PP - Fisher Chi-square	4.86	0.9626	64.21**	0	12.21	0.4292	51.97**	0	22.34*	0.0339	56.3**	0
Dividend Payout (DPO)												
Levin, Lin & Chu t (LLC)	1.28	0.9001	-6.62**	0	0.06	0.5221	-6.84**	0	-2.27*	0.0115	-9.53**	0
Breitung t-stat									2.48	0.9935	-2.38**	0.0087
IPS W-stat					1.06	0.8565	-2.3*	0.0106	0.8	0.7875	-2.02*	0.0218
ADF - Fisher Chi-square	4.62	0.9695	45.52**	0	7.56	0.8182	37.92**	0.0002	17.61	0.1282	37.45**	0.0002
PP - Fisher Chi-square	6.62	0.8817	76.88**	0	10.78	0.5477	64.54**	0	34.99**	0.0005	50.98**	0
Dividend Yield (DY)												
Levin, Lin & Chu t (LLC)	0.02	0.5067	-8.23**	0	-0.87	0.1925	-8.19**	0	-3.72**	0.0001	-6.49**	0
Breitung t-stat									0.53	0.7011	0.2	0.5788
IPS W-stat					0.72	0.7648	-4.19**	0	-0.13	0.4472	-1.82*	0.0346
ADF - Fisher Chi-square	7.55	0.8196	66.33**	0	10.41	0.5803	42.15**	0	14.32	0.2805	35.23**	0.0004
PP - Fisher Chi-square	9.12	0.6923	66.15**	0	13.28	0.3491	48.16**	0	31.76**	0.0015	49.71**	0

Note:Levin, Lin & Chu t & Breitung t-stat - Null: Unit root (assumes common unit root process) IPS (Im, Pesaran & Shin) W-stat, ADF - Fisher Chi-square & PP - Fisher Chi-square - Null: Unit root (assumesindividual unit root process)
Source: Computed from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.
** Significant at 1% level; * Significant at 5% level.

From the **table 3.1** it is seen that all the three test statistics (LLC, ADF & PP) are insignificant for MPS data at level, in turn indicating that the MPS at level has unit root and hence it is non-stationary. On the other hand, all the three test statistics are significant for thefirst difference MPS data series i.e. the MPS data are non-stationary at level and are stationary when first difference. In the same way, the MPS data series has unit root at level and has no unit root at first difference about a constant as well as

with time trend as test

statistic, IPS W-stat for the model with intercept and without trends, Breitung t-test for modelwith both intercept and time trend is insignificant at level and is significant at first difference besides LLC, ADF and PP test statistics.

For DPS, the ADF test result shows the critical value as 0.69 at first difference; that offor PP-test as 53.85; and that of for LLC test as -8.59, which are highly significant at 1%level for no intercept and no trend. The ADF test result shows the critical value as 45.66, thatof for PP – test as 32.97; and that of for LLC test as -9.35, which are highly significant at 1% level for with intercept and no trend. The ADF test result shows the critical value as 48.55; that of for PP – test as 25.02; and that of for LLC test as -11.76, which are highly significant at 1% level for with intercept and with trend. The test results reveal that the DPS data are integrated of order 1, i.e. I (1). satisfying one precondition for co-integration test.

For DPO, the ADF test result shows the critical value as 45.52; that of for PP – test as 76.88; and that of for LLC test as -6.62 at first difference, which are highly significant at 1% level for no intercept and no trend; the ADF test result shows the critical value as 37.92; that of for PP – test as 64.54; and that of for LLC test as -6.84, which are highly significant at 1% level for with intercept and no trend. The ADF test result shows the critical value as 37.45; that of for PP – test as 50.98; and that of for LLC test as -9.53, which are highly significant at1% level for intercept and with trend. The test results reveal that the DPO data are integrated of order 1, i.e. I (1) satisfying one precondition for co-integration test.

For DY, the ADF test result shows the critical value as 66.33; that of for PP – test as 66.15; and that of for LLC test as -8.23, which are highly significant at 1% level for no intercept and no trend, the ADF test result shows the critical value as 42.15; that of for PP – test as 48.16; and that of for LLC test as -8.19, which are highly significant at 1% level for with intercept and no trend. For intercept and with trend, the ADF test result shows the critical value as 35.23; that of for PP – test as 49.71; and that of for LLC test as -6.49, which are highly significant at 1% level. The results indicate that the DY data are integrated of order1, i.e. I (1) satisfying one precondition for co-integration test.

Lag Length Selection

The results of the analysis determining the lags for co-integration model between MPS and dividend variables such as DPS, DPO and DY for **Industry sector** are shown in t**able 3.2**.

Table 3.2 Lag Leg Selection Criteria for Co-integration Test for Market Price per Sharewith Dividend Variables of Firms under Industry Sector

Lag	LogL	LR	FPE	AIC	SC	HQ
Market Price per Share (MPS) and Dividend per Share (DPS)						
0	-267.2	NA	1.90E+07	22.43	22.53	22.46
1	-218.5	85.32	4.60E+05	18.71	19	18.78
2	-213.1	8.42	4.10E+05	18.6	19.09	18.73
3	-203.7	13.35	2.70E+05	18.14	18.83	18.33
4	-190.6	16.46*	1.3E+05*	17.38	18.26*	17.61
5	-188.2	2.57	1.60E+05	17.51	18.59	17.8
6	-180.7	6.89	1.30E+05	17.22*	18.5	17.56*
Market Price per Share (MPS) and Dividend Payout (DPO)						
0	-299.5	NA	2.80E+08	25.13	25.22	25.15
1	-232.1	118.03	1.40E+06	19.84	20.13*	19.92
2	-228.8	5.24	1.50E+06	19.9	20.39	20.03
3	-222	9.53*	1.20E+06	19.67	20.36	19.85
4	-216.3	7.13	1.1E+06*	19.53*	20.41	19.76*
5	-215.1	1.32	1.50E+06	19.76	20.84	20.04
6	-210.5	4.24	1.60E+06	19.71	20.98	20.04
Market Price per Share (MPS) and Dividend Yield (DY)						
0	-	NA	1.10E+0	19.59	19.69	19.62

	233.1		6			
1	-166	117.52	5.80E+03	14.33	14.63*	14.41
2	-165.9	0.2	8.00E+03	14.66	15.15	14.79
3	-155.9	14.06	5.00E+03	14.16	14.85	14.34
4	-148.3	9.60*	3.9E+03*	13.86	14.74	14.09*
5	-146	2.42	4.80E+03	14	15.08	14.29
6	-139.6	5.85	4.40E+03	13.80*	15.08	14.14

*Indicates lag order selected by the criterion
LR : sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error ; AIC: Akaike information criterion SC : Schwarz information criterion
HQ : Hannan-Quinn information criterion
Source: Computed from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.

Based on the lag length suggested by majority of criterion, lag length for co-integration test is four each between MPS and DPS; between MPS and DPO; and between MPS and DY (the lag suggested by FPE and AIC is superior over LR test). Hence, the chosen lag length for co-integration test between MPS and DPS, MPS and DPO, and MPSand DY for **Industry sector** is four each respectively.

Co-integration Test

Table 3.3 Co-integration Test Results for Market Price per Share and DividendVariables of Firms under Industry Sector

Test	Hypothesized Number of Cointegration	No Deterministic Trend				Linear Deterministic Trend							
						Intercept No Time Trend				Intercept and Time Trend			
		Eigen-value	Statistic	Critical Value	p Value	Eigen-value	Statistic	Critical Value	p Value	Eigen-value	Statistic	Critical Value	p Value
Market Price per Share (MPS) and Dividend Per Share (DPS)													
Trace	None@	0.4401	17.40**	12.32	0.0065	0.4572	18.70*	15.49	0.0159	0.3609	14.83	18.4	0.1473
	At most 1	0	0	4.13	0.9978	0.0122	0.37	3.84	0.5438	0.0454	1.4	3.84	0.2375
Maximum Eigenvalue	None@	0.4401	17.40**	11.22	0.0037	0.4572	18.33**	14.26	0.0108	0.3609	13.43	17.15	0.1604
	At most 1	0	0	4.13	0.9978	0.0122	0.37	3.84	0.5438	0.0454	1.4	3.84	0.2375
Market Price per Share (MPS) and Dividend Payout (DPO)													
Trace	None@	0.3348	12.32*	12.32	0.0499	0.3014	13.76	15.49	0.0897	0.2687	17.83	18.4	0.0599
	At most 1@	0.0031	0.09	4.13	0.802	0.0953	3	3.84	0.0831	0.2452	8.44**	3.84	0.0037
Maximum Eigenvalue	None@	0.3348	12.23*	11.22	0.0332	0.3014	10.76	14.26	0.1666	0.2687	9.39	17.15	0.4559
	At most 1@	0.0031	0.09	4.13	0.802	0.0953	3	3.84	0.0831	0.2452	8.44**	3.84	0.0037
Market Price per Share (MPS) and Dividend Yield (DY)													
Trace	None@	0.3304	13.60*	12.32	0.0303	0.2946	10.73	15.49	0.2285	0.2723	10.2	18.4	0.4612
	At most 1	0.051	1.57	4.13	0.2465	0.0087	0.26	3.84	0.6087	0.0219	0.67	3.84	0.4148
Maximum Eigenvalue	None@	0.3304	12.03*	11.22	0.036	0.2946	10.47	14.26	0.1829	0.2723	9.54	17.15	0.4413
	At most 1	0.051	1.57	4.13	0.2465	0.0087	0.26	3.84	0.6087	0.0219	0.67	3.84	0.4148

Note: p Values based on MacKinnon-Haug-Michelis (1999)
Source: Computed from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.
**Significant at 1% level; *Significant at 5% level.

The results of the co-integration test are shown in **table 3.3**. The test results show that the data series are co-integrated as both the trace test and the maximum Eigen-value testreject the null hypothesis of no co-integration, and suggests that there are two significant co- integrating vectors in the model, which implies that there are two common stochastic trends, showing a market integration.

The results of trace test and maximum eigen value test without deterministic trend for DPS and MPS show the critical value as **12.32** and **11.22**, statistical value as **17.40** each respectively, which are highly significant at 1% level; that of for with intercept and without time trend the critical value as **15.49** and **14.26**, statistical value as **18.70** and **18.33** respectively, which are significant at 5% level; and that of for with intercept and time trend the critical value as **18.40** and **17.15**, statistical value as **14.83** and **13.43** respectively.

The statistical values of the trace test and maximum eigen value test > critical values for two situations i.e. without deterministic trend, with intercept without time

trend hence the null hypothesis H_0^1: "there is no co-integration between dividend per share (DPS) and

shareholders' wealth (SW) of **Industry sector** in India" is rejected at 1% (without deterministic trend) and 5% level (with intercept without time trend) respectively. Therefore, the co-integration results prove that there exists a stationary, long-run relationship between DPS and MPS for **Industry sector**.

The results of trace test and maximum eigen value test without deterministic trend for DPO and MPS show the critical value as **12.32** and **11.22**, statistical value as **12.32** and **12.23** respectively which are significant at 5% level; that of for with intercept and without time trend the critical value as **15.49** and **14.26**, statistical value as **13.76** and **10.76**; and that of for with intercept and time trend the critical value as **18.40** and **17.15**, statistical value as **17.83** and **9.39** respectively, which are not significant.

The statistical values of the trace test and maximum eigen value > critical value for one situation i.e. without deterministic trend, hence the null hypothesis H_0^2: "there is no co-integration between dividend payout (DPO) and shareholders' wealth (SW) of **Industry sector** in India" is rejected at 5% level for no deterministic trend model. Therefore, the co-integration results prove that there exists a stationary, long-run relationship between DPO and MPS for **Industry sector**.

The results of trace test and maximum eigen value without deterministic trend for DY and MPS show the critical value as **12.32** and **11.22**, statistical value as **13.60** and **12.03** respectively, which are significant at 5% level; that of for with intercept and without time trend it shows the critical value as **15.49** and **14.26**, statistical value as **10.73** and **10.47** respectively; and that of for with intercept and time trend the critical value as **18.40** and **17.15**, statistical value as **10.20** and **9.54** respectively.

The statistical values of the trace test and maximum eigen value > critical value for one situation i.e. without deterministic trend hence the null hypothesis H_0^3: "there is no co-integration between dividend yield (DY) and shareholders' wealth (SW) of **Industry sector** in India" is rejected at 5% level. Therefore, the co-integration results prove that there exists a stationary, long-run relationship between DY and MPS for **Industry sector**. In other words, it can be concluded that the investors consider the DY, in the long-run, to value shares of firms under **Industry sector**, which shows the presence of a long-run relationship between DP and SW (MPS and DPS; MPS and DPO; and MPS and DY) of the firms under **Industry sector** in India.

Technology sector

Test of Normality

Table **4** presents the mean, standard deviation, skewness and kurtosis along with JB test for MPS, DPS, DY, DPO and EPS of six firms under **Technology sector**. From the standard deviation, it is found that MPS is high for majority of the firms under **Technology sector**. Skewness > 1 for two firms (Hexaware Technologies and Wipro). The MPS data is moderately skewed (moderately asymmetric) for the whole six firms. The JB test statistics forMPS data are insignificant for five firms and are significant for one firm viz., Hexaware technologies. This led to accept null hypothesis that the data are normally distributed, i.e. the MPS of five firms under **Technology sector** are normally distributed.

For DPS, the mean ranges from 0.51 (Mphasis) to 8.57 (Infosys). The skewness lies between -0.50 and + 0.50 for most of the firms under **Technology sector**. Out of six firms with play kurtic, the DPS data are found to be with kurtosis approximately equal to 3 for two firms and is > 3 for four firms. This indicates that the DPS data are approximately symmetric.For DY, the skewness lies between -0.50 and + 0.50 for most of the firms under **Technology sector**. The skewness is > 1 for two firms viz., Mphasis and Zee Entertainment. Theremaining four firms are moderately skewed. Out of six firms, data are found to be kurtic for most of the firms, whereas it is > 3 for three firms viz., Mphasis, Wipro and Zee Entertainment. The JB test result shows that it is insignificant for five firms, which meansthat there is presence of normality in the DY under **Technology sector**.

For DPO, the skewness lies between -0.50 and + 0.50 for most of the firms except for one firm viz., Mphasis. The data are found to be kurtic for most of the firms and the JB test values are insignificant for four firms, which confirm the presence of normality in the DPO. Similarly, the EPS shows that the JB test results are not significant for six firms, which showsthat there is presence of normality in the EPS also. The results are positively skewed for all the firms except for one firm viz., Zee Entertainment. Therefore, it is concluded that theMPS, DY, DPO and EPS are normally distributed for most of the firms under **Technology sector** in India.

Table 4 Descriptive and Jarque-Bera Normality Test Statistics for Market Price per Share and Dividend / Earning Variables for Firms under Technology Sector from 2003
- 04 to 2012 – 13

Company Name	Mean	SD	Skewness	Kurtosis	Jarque Bera	
					Value	p Level
Market Price per Share (MPS)						
HCL Technologies	380.73	139.5	0.14	1.75	0.68	0.7124
Hexaware Technologies	158.55	137.8	1.85	5.46	8.22*	0.0164
Infosys	2538.8	747.9	0.95	4	1.91	0.3856
Mphasis	368.82	151	0.4	1.7	0.97	0.6154
Wipro	582.21	270.3	1.65	4.65	5.69	0.0582
Zee Entertainment	192.28	61.08	0.47	1.99	0.8	0.6714
Dividend Per Share (DPS)						
HCL Technologies	5.05	1.92	0.21	2.13	0.39	0.8231
Hexaware Technologies	0.99	0.81	1.11	2.92	2.07	0.3547
Infosys	8.57	6.88	1.7	5.27	6.96*	0.0308
Mphasis	0.51	0.44	2.33	7	15.69**	0.0004
Wipro	4	3.71	2.61	7.93	21.43**	0
Zee Entertainment	1.86	1.02	1.81	5.64	8.34*	0.0155
Dividend Yield (DY)						
HCL Technologies	1.44	0.62	0.31	1.8	0.76	0.6839
Hexaware Technologies	1.04	0.92	0.54	1.79	1.09	0.58
Infosys	0.32	0.15	0.12	2.91	0.03	0.9858
Mphasis	0.15	0.11	1.96	6.04	10.27**	0.0059
Wipro	0.65	0.24	0.83	3.35	1.2	0.5486
Zee Entertainment	0.98	0.45	1.47	4.55	4.61	0.0998
Dividend Payout (DPO)						
HCL Technologies	35.18	20.08	0.96	2.43	1.66	0.4353
Hexaware Technologies	9.41	21.79	-1.21	4.42	3.28	0.1941
Infosys	7.88	4.28	0.55	2.22	0.75	0.6867
Mphasis	3.23	2.31	0.37	1.58	1.08	0.5841
Wipro	16.79	8.54	2.14	6.55	12.87**	0.0016
Zee Entertainment	43.43	26.41	1.79	4.96	6.96*	0.0308
Earning Per Share (EPS)						
HCL Technologies	15.9	5.32	1.28	3.86	3.05	0.2172
Hexaware Technologies	7.15	4.4	0.2	3.67	0.25	0.8815
Infosys	102.9	34.32	0.71	2.25	1.08	0.5814
Mphasis	21.64	14.06	0.26	1.69	0.83	0.6619
Wipro	21.92	5.89	1.56	4.93	5.62	0.0601
Zee Entertainment	4.87	2.17	-0.09	2.11	0.34	0.8433

Source: Computed from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.

** Significant at 1% level; * Significant at 5% level.

Unit Root Test

The results of the panel unit root test for Technology sector are reported in table 4.2. From the table it can be seen that all the three test statistics (LLC, ADF & PP) for first model (no intercept and no trend) are significant for MPS data at level, in turn indicating that the MPS at level has no unit root and hence is stationary. On the other hand, all the three test statistics are significant for the first difference MPS data series, i.e. the MPS data are

stationary at level and first difference for no intercept and no trend, with intercept and notrend.

The ADF test result shows the critical value as 38.58; that of for PP – test as 23.40 at 5% level each respectively; and that of for LLC test as -5.00, which is highly significant at1% level for no intercept and no trend.

Table 4.2 Unit Root Test (Panel) Results for Market Price per Share and DividendVariables for Firms under Technology Sector

Method	No Intercept No Trend				Intercept No Trend				Intercept and Trend			
	Level		First Difference		Level		First Difference		Level		First Difference	
	Statistic	p Value	Statistic	p Value	Statistic	p Value	Statistic	p Value	Statistic	p Value	Statistic	p Value
Market Price per Share (MPS)												
Levin, Lin & Chu t (LLC)	-5**	0	-7.93**	0	-11.55**	0	-7.38**	0	-5.4**	0	-3.56**	0.0002
Breitung t-stat									0.01	0.5049	-1.79*	0.0363
IPS W-stat					-4.79**	0	-3.33**	0.0004	-0.57	0.2853	-0.5	0.3092
ADF - Fisher Chi-square	38.58**	0.0001	63.71**	0	43.95**	0	34.69**	0.0005	16.9	0.1532	17.9	0.1189
PP - Fisher Chi-square	23.4*	0.0245	78.4**	0	40.72**	0.0001	45.67**	0	36.34**	0.0003	36.79**	0.0002
Dividend per Share (DPS)												
Levin, Lin & Chu t (LLC)	-0.67	0.253	-19.76**	0	-19.99**	0	-20.02**	0	-19.45**	0	-8.4**	0
Breitung t-stat									1.7	0.9555	0.16	0.5652
IPS W-stat					-8.59**	0	-7.7**	0	-2.55**	0.0053	-1.53	0.0635
ADF - Fisher Chi-square	20.53	0.0578	61.92**	0	41.71**	0	54.62**	0	22.58*	0.0315	31.87**	0.0015
PP - Fisher Chi-square	24.69*	0.0164	63.73**	0	38.42**	0.0001	56.65**	0	39.59**	0.0001	59.54**	0
Dividend Payout (DPO)												
Levin, Lin & Chu t (LLC)	-2.81**	0.0025	-13.46**	0	-10.86**	0	-12.05**	0	-9.25**	0	-9.78**	0
Breitung t-stat									-1.34	0.0904	-0.56	0.2877
IPS W-stat					-5.92**	0	-6.41**	0	-1.85*	0.032	-2.4**	0.0083
ADF - Fisher Chi-square	21.24*	0.047	76.02**	0	50.96**	0	57.09**	0	32.23**	0.0013	41.47**	0
PP - Fisher Chi-square	25.58*	0.0123	85.01**	0	50.21**	0	70.02**	0	40.47**	0.0001	66.72**	0
Dividend Yield (DY)												
Levin, Lin & Chu t (LLC)	2.32	0.9899	-14.27**	0	-3.88**	0.0001	-15.76**	0	-12.22**	0	-6.35**	0
Breitung t-stat									-0.19	0.4241	2.3	0.9892
IPS W-stat					-2.19*	0.0144	-8.44**	0	-2.84**	0.0023	-2.59**	0.0048
ADF - Fisher Chi-square	6.55	0.8858	72.39**	0	31.54**	0.0016	68.84**	0	43.99**	0	52.33**	0
PP - Fisher Chi-square	15.21	0.2302	75.29**	0	29.48**	0.0033	70.48**	0	41.76**	0	66.7**	0

Note: Levin, Lin & Chu t & Breitung t-stat - Null: Unit root (assumes common unit root process)

IPS (Im, Pesaran & Shin) W-stat, ADF - Fisher Chi-square & PP - Fisher Chi-square - Null: Unit root (assumesindividual unit root process)
Source: Computed from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.
** Significant at 1% level; * Significant at 5% level.

The ADF test result shows the critical value as 43.95; that of for PP – test as 40.72; and that of for LLC test as -11.55, which are highly significant at 1% level for with intercept and no trend. The test results reveal that the MPS data are integrated of order 1, i.e. I (1) satisfying one precondition for co-integration test.

Regarding the DPS data series, it is found from unit root test with zero-mean (no intercept and no trend) that only intercept (intercept and no trend) is stationary at level and

with intercept and trend, the DPS data series are stationary (no unit root) at first difference. The ADF test result shows the critical value as 61.92; that of for PP – test as 63.73; and thatof for LLC test as -19.76, which are highly significant at 1% level for no intercept and no trend. The ADF test result shows the critical value as 41.71; that of for PP – test as 38.42; and that of for LLC test as -19.99, which are highly significant at 1% level for with intercept and no trend. The ADF test result shows the critical value as 31.87; that of for PP – test as 59.54; and that of for LLC test as -8.40, which are highly significant at 1% level for with intercept and with trend. The results indicate that the DPS data are integrated of order 1, i.e. I
(1) satisfying one precondition for co-integration test.

With regard to DPO data series, the ADF test result shows the critical value as 76.02; that of for PP – test as 85.01; and that of for LLC test as -13.46, which are highly significant at 1% level for no intercept and no trend. The ADF test result shows the critical value as 50.96; that of for PP – test as 50.21; and that of for LLC test as -10.86, which are highly significant at 1% level for with intercept and no trend. For with intercept and trend, the ADFtest result shows the critical value as 32.23; that of for PP – test as 40.47; and that of for LLC test as -9.25, which are highly significant at 1% level. This shows that the DPO data series are integrated of order I(1) for **Technology sector**.

With regard to DY, the ADF test result shows the critical value as 72.39; that of forPP – test as 75.29; and that of for LLC test as -14.27, which are highly significant at 1% levelfor no intercept and no trend. The ADF test result shows the critical value as 31.54; that offor PP – test as 29.48; and that of for LLC test as -3.88, which are highly significant at 1% level for with intercept and no trend. The ADF test result shows the critical value as 43.99; that of for PP – test as 41.76; and that of for LLC test as -12.22, which are highly significant at 1% level for with intercept and trend. The test results reveal that the DY data are integratedof order 1, i.e. I (1) satisfying one precondition for co-integration test.

Lag Length Selection

As shown in **table 4.3** the LR, FPE, AIC and HQ criteria suggest use of six lags while SC criterion suggests use of one lag for co-integrating DPS with MPS; the criterion LR, FPE, AIC and HG suggest six lags while SC criterion suggest one for better fit the model co-integrating MPS with DPS. Based on the lag length suggested by majority of criterion, five lag is chosen for co-integration test between MPS and DPS for **Technology sector**. Similarly,

the chosen lag length for co-integration test is three between MPS and DPO; and it is three between MPS and DY (the lag suggested by FPE and AIC is superior over LR test).

Table 4.3 Lag Length Selection Criteria for Co- integration Test for Market Price perShare with Dividend Variables of Firms under Technology Sector

Lag	LogL	LR	FPE	AIC	SC	HQ
Market Price per Share (MPS) and Dividend per Share (DPS)						
0	-241.3	NA	2.20E+06	20.27	20.37	20.3
1	-204.6	64.11	1.40E+05	17.55	17.85	17.63
2	-202.5	3.36	1.70E+05	17.71	18.2	17.84
3	-184.7	25.22*	5.50E+04	16.56	17.25*	16.74
4	-180.4	5.41	5.60E+04	16.53	17.42	16.77
5	-173.6	7.34	4.8E+04*	16.30*	17.38	16.59*
6	-171.7	1.76	6.30E+04	16.47	17.75	16.81
Market Price per Share (MPS) and Dividend Payout (DPO)						
0	-293.2	NA	1.70E+08	24.6	24.69	24.62
1	-258.8	60.21	1.30E+07	22.06	22.36	22.14
2	-258.3	0.74	1.80E+07	22.36	22.85	22.49
3	-238.6	27.87*	4.9E+06*	21.05	21.74*	21.23*
4	-234.3	5.39	5.00E+06	21.02*	21.91	21.26
5	-232.6	1.82	6.50E+06	21.22	22.3	21.5
6	-	1.79	8.60E+0	21.39	22.66	21.73

	230.7		6			
Market Price per Share (MPS) and Dividend Yield (DY)						
0	-217.8	NA	3.10E+05	18.32	18.41	18.34
1	-178.9	68.04	1.70E+04	15.41	15.7	15.49
2	-178.5	0.65	2.30E+04	15.71	16.2	15.84
3	-161.6	23.98*	8.0E+03*	14.64*	15.32*	14.82*
4	-159	3.23	9.40E+03	14.75	15.63	14.98
5	-157.4	1.76	1.20E+04	14.95	16.03	15.23
6	-156.3	0.93	1.80E+04	15.19	16.47	15.53

*Indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test

at 5% level) FPE: Final prediction error; AIC:

Akaike information criterion

SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion

Source: Computed from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.

Hence, the chosen lag length for co-integration test between MPS and DPS, MPS andDPO, and MPS and DY is five and three each respectively for **Technology sector**.

Co-integration Test

Table 4.4 Co-integration Test Results for Market Price per Share and DividendVariables of Firms under Technology Sector

Test	Hypothesized Number of Cointegration	No Deterministic Trend				Linear Deterministic Trend							
						Intercept No Time Trend				Intercept and Time Trend			
		Eigen-value	Statistic	Critical Value	p Value	Eigen-value	Statistic	Critical Value	p Value	Eigen-value	Statistic	Critical Value	p Value
Market Price per Share (MPS) and Dividend Per Share (DPS)													
Trace	None	0.1903	5.11	12.32	0.552	0.2154	6.53	15.49	0.6327	0.2014	5.92	18.4	0.8753
	At most 1	0.002	0.05	4.13	0.8592	0.0292	0.71	3.84	0.3994	0.0214	0.52	3.84	0.4716
Maximum	None	0.1903	5.06	11.22	0.4682	0.2154	5.82	14.26	0.6362	0.2014	5.4	17.15	0.8711
Eigenvalue	At most 1	0.002	0.05	4.13	0.8592	0.0292	0.71	3.84	0.3994	0.0214	0.52	3.84	0.4716
Market Price per Share (MPS) and Dividend Payout (DPO)													
Trace	None	0.2275	11.47	12.32	0.0692	0.2937	13.91	15.49	0.0855	0.2646	12.44	18.4	0.2776
	At most 1	0.0586	2.17	4.13	0.1656	0.0379	1.39	3.84	0.2383	0.0375	1.38	3.84	0.2406
Maximum	None	0.2275	9.29	11.22	0.1073	0.2937	12.52	14.26	0.0927	0.2646	11.06	17.15	0.3068
Eigenvalue	At most 1	0.0586	2.17	4.13	0.1656	0.0379	1.39	3.84	0.2383	0.0375	1.38	3.84	0.2406
Market Price per Share (MPS) and Dividend Yield (DY)													
Trace	None	0.0877	4.93	12.32	0.5775	0.1039	4.28	15.49	0.8793	0.1115	4.9	18.4	0.9404
	At most 1[@]	0.0441	1.62	4.13	0.2376	0.0093	0.33	3.84	0.5629	0.0179	0.65	3.84	0.4203
Maximum	None	0.0877	3.3	11.22	0.7401	0.1039	3.95	14.26	0.8646	0.1115	4.25	17.15	0.9495
Eigenvalue	At most 1[@]	0.0441	1.62	4.13	0.2376	0.0093	0.33	3.84	0.5629	0.0179	0.65	3.84	0.4203

Note: p Values based on MacKinnon-Haug-Michelis (1999)
Source: Computed from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.
**Significant at 1% level; *Significant at 5% level.

Table 4.4 shows the co-integration test results that the DPS and MPS have no long-run relationship for without deterministic trend, with intercept without time trend as well as with intercept and time trend.

The results of trace test and Maximum eigen value test without deterministic trend forDPS and MPS show the critical value as **12.32** and **11.22**, statistical value as **5.11** and **5.06** respectively; that of for with intercept and without time trend the critical value as **15.49** and **14.26**, statistical value as **6.53** and **5.82** respectively; and that of for with intercept and time trend the critical value as **18.40** and **17.15**, statistical value as **5.92** and **5.4** respectively,which are not significant because the data series is not co-integrated for both the trace testand the maximum eigen value test hence the null hypothesis H_0^1: "there is no co-integration between dividend per share (DPS) and shareholders' wealth (SW) of **Technology sector** in India" is accepted, implying that there is insignificant co-integrating vectors in the model. The absence of long-run relationship between DPS and MPS is proved by trace test and maximum eigen value test without deterministic trend, with intercept without time trend as well as with intercept and time trend.

The statistical values of the trace test and maximum eigen value test < critical values for the three situations, which reveals that the investors have never shown any importance to the DPS while valuing the shares of **Technology sector** in the long-run.

The results of trace test and maximum eigen value test without deterministic trend for DPO and MPS show the critical value as **12.32** and **11.22**, statistical value as **4.93** and **3.30** respectively; that of for with intercept and without time trend the critical value as **15.49** and **14.26**, statistical value as **4.28** and **3.95** respectively; and that of for with intercept and time trend the critical value as **18.40** and **17.15**, statistical value as **12.44** and **11.06** respectively, which are not significant because the data series is not co-integrated for both the trace testand the maximum eigen value test hence the null hypothesis **H** ^{2}**:** "there is no co-integration between dividend payout (DPO) and shareholders' wealth (SW) of **Technology sector** in India" is accepted, implying that there is insignificant co-integrating vectors in the model. The absence of long-run relationship between DPO and MPS is proved by trace test and maximum eigen value test without deterministic trend, with intercept without time trend as well as with intercept and time trend.

The statistical values of the trace test and maximum eigen value test < critical values for the three situations, which reveals that the investors have never shown any importance to the DPO while valuing the shares of **Technology sector** in the long-run.

The results of trace test and maximum eigen value test without deterministic trend for DY and MPS show the critical value as **12.32** and **11.22**, statistical value as **4.93** and **3.30** respectively; that of for with intercept and without time trend the critical value as **15.49** and **14.26**, statistical value as **4.28** and **3.95** respectively; and that of for with intercept and time trend the critical value as **18.40** and **17.15**, statistical value as **4.90** and **4.25** respectively, which are not significant because the data series is not co-integrated for both the trace testand the maximum eigen value test hence the null hypothesis **H0**^{3}**:** "there is no co-integration between dividend yield (DY) and shareholders' wealth (SW) of **Technology sector** in India" is accepted, implying that there is insignificant co-integrating vectors in the model. The absence of long-run relationship between DY and MPS is proved by trace test and maximum eigen value test without deterministic trend, with intercept without time trend as well as with intercept and time trend.

The statistical values of the trace test and maximum eigen value test < critical values for the three situations, which reveals that the investors have never shown any importance to the DY while valuing the shares of **Technology sector** in the long-run. Hence, it is concluded that there is no co-integration between MPS and DPS; MPS and DPO; and MPS and DY under **Technology sector**.

9. RESULTS AND DISCUSSION OF IMPACT OF DP ON SW

Table 5 is reported with the results of regression for eliciting the impact of DP onSW. There are two regressions; first one with dividend variables (DPS, DPO and DY) besides the financial factors (P, LEV, OF, LQ, EPS, WF, AQ) and the second one is with financial factors (P, LEV, OF, LQ, EPS, WF, AQ) only.

The significance of the explanatory power of DP on SW, when all the financial factors are held constant, is found based on F value obtained from comparing R^2 values of thetwo models using the following formula:

$$F = \frac{(R_L^2 - R_S^2)/(df_L - df_s)}{(1 - R_L^2)/(N - df_L - 1)}$$

Where,

R^2_L = R^2 from the larger model (full model)

R^2_S = R^2 from the smaller model (subset model after removing certain predictors)df_L = Row degrees of freedom (or number of predictors) in the larger model

df_S = Row degrees of freedom in the smaller model

N = Number of observations **General form of the Regression Model (Full model withdividend variables)**

MPS = β1 (P) + β2 (LEV) + β3 (OF) + β4 (LQ) + β5 (EPS) + β6 (WF) + β7(AQ) + β8 (DPS) + e

Market price per share (MPS), Profitability (P), Leverage (LEV), Owners fund (OF), Liquidity (LQ), Earnings
per share (EPS), Working fund (WF), Asset quality (AQ), Dividend per share (DPS)

General form of the Regression Model (Subset model after removing dividend variables)

MPS = β1 (P) + β2 (LEV) + β3 (OF) + β4 (LQ) + β5 (EPS) + β6 (WF) + β7(AQ) + e

Market price per share (MPS), Profitability (P), Leverage (LEV), Owners fund (OF), Liquidity (LQ), Earningsper share (EPS), Working fund (WF), Asset quality (AQ).

Table 5.1 Impact of Dividend policy (after Partialling out the Effect of Financial Performance) on Shareholders' Wealth for Industry Sector

Estimators	Full Model with Dividend Variables		Subset Model after RemovingDividend Variables	
	Beta (β)	t-value	Beta (β)	t-value
Intercept (MPS)	6.751**	10.89	8.025**	9.66
Profitability (P)	0.809	0.82	3.653**	2.87
Leverage (LEV)	-0.294	-0.49	-2.331**	-3.07
Owners Fund (OF)	-0.274	-0.55	1.195	1.86
Liquidity (LQ)	-0.272	-0.96	-0.657	-1.71
Earning per Share (EPS)	0.789**	5.98	1.217**	7.94
Working Fund (WF)	-0.163	-1.36	0.199	1.46
Asset Quality (AQ)	0.682*	2.2	1.352**	3.35
Dividend policy (DPS)	0.142**	3.02		
R^2	0.8463		0.6724	
Adjusted R^2	0.8149		0.6283	
F Value	26.98**		15.25**	
Degrees of Freedom	10..49		7..52	
Significance of theChange in R^2	**F Value** 18.48**		**DF** 3..49	

Source: Computed result from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.
**Significant at 1% level; *Significant at 5% level.

     As per the **table 5.1**, both the full and the subset models of regressions are fitted significantly. From the observation of the individual coefficients in both the models, it is found that the SW tends to increase with significant increase in P, EPS and AQ. Regardingthe DP, it is found that the SW seems to increase at significant level when there has been a significant increase in DPS ($\beta = 0.142$, t = 3.02, p < 0.01). While the full model, with both the dividend and the financial factors as predictors, has the power of explanation to the extentof 84.63 per cent of the variation, the subset model, with only financial factors as predictors, explains only to the extent of 67.24 per cent of the variation in the SW. The additional variance in the response variable (SW) explained by

the dividend variables is 18.66 per cent ($R^2{}_L$ – $R^2{}_S$). Further, the additional variance in the presence of dividend variables is highly significant at 1% level (F value = 18.48, p < 0.01). Hence, **H0[4]:** "there is no significant impact of dividend policy (DP) on shareholders' wealth (SW) of **Industry sector** in India" is rejected at 1% level. Therefore, it is concluded that the DP has influence (impact) in creating additional wealth to the shareholders of firms under **Industry sector** in India.

Technology sector

Table 6 Impact of Dividend policy (after Partialling out the Effect of Financial Performance) on Shareholders' Wealth for Technology Sector

	Technology Sector			
Estimators	**Full Model with Dividend Variables**		**Subset Model after RemovingDividend Variables**	
	Beta (β)	**t-value**	**Beta (β)**	**t-value**
Intercept (MPS)	6.567**	19.48	6.691**	14.55
Profitability (P)	0.292	0.54	2.052**	3.03
Leverage (LEV)	-1.021**	-2.82	-2.297**	-5.3
Owners Fund (OF)	-0.019	-0.03	0.501	0.62
Liquidity (LQ)	-0.555**	-2.76	-1.444**	-6.77
Earning per Share (EPS)	0.165	0.57	1.049**	2.82
Working Fund (WF)	0.208	1.55	0.292	1.54
Asset Quality (AQ)	-0.103	-0.32	0.918**	2.62
Dividend policy (DPS)	0.077**	4.34		
R^2	0.9005		0.7823	
Adjusted R^2	0.8802		0.753	
F Value	44.33**		26.69**	
Degrees of Freedom	10..49		7..52	
Significance of theChange in R^2	**F Value** 19.40**		**DF** 3..49	

Source: Computed result from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.
**Significant at 1% level

As per the **table 6**, both the full and the subset models of regressions are fitted

significantly. From the observation of the individual coefficients in both the models, it is found that the SW tends to increase with the significant increase in P, EPS and AQ. Regarding the DP, it is found that the SW seems to increase at significant level when therehas been a significant increase in DPS ($\beta = 0.077$, $t = 4.34$, $p < 0.01$). While the full model, with both the dividend and the financial factors as predictors, has the power of explanation to the extent of 90.05% of the variation, the subset model, with only financial factors aspredictors, explains only to the extent of 67.24 per cent of the variation in the SW.

The additional variance in the dependent variable (SW) explained by the dividend variables is 12.72 per cent ($R^2_L - R^2_S$). Further, the additional variance in the presence of dividend variables is highly significant at 1% level (F value = 19.40, $p < 0.01$). Hence, H_0^4:

"there is no significant impact of dividend policy (DP) on shareholders' wealth (SW) of **Technology sector** in India" is rejected at 1% level. Therefore, it is concluded that the DPhas influence (impact) in creating additional wealth to the shareholders' of firms under**Technology sector** in India.

10. DIFFERENCE IN THE IMPACT OF DP ON SW BETWEEN PRE AND POST FINANCIAL MELTDOWN PERIODS

To test whether there is any significant difference in the impact of DP on SW betweenpre and post financial melt down periods, Chow test has been used and the results are shown in **table 7**. By applying Chow test, an attempt has been made to estimate whether there has been any significant difference in the impact of DP on SW between pre and post financial meltdown periods using the following formula:

$$F = \frac{(RSS_p - (RSS_1 + RSS_2))/k}{(RSS_1 + RSS_2)/(N_1 + N_2 - 2k)},$$

This is distributed as F with k and n1 + n2 – 2k degrees of freedom
Where, F is the test statistic
RSS $_p$ = residual sum of squares for the whole sample
RSS1 = residual sum of squares for the first group (before financial meltdown) RSS2 = residual sum of squares for the second group (after financial meltdown)N = number of observations
K = number of regressors (including the intercept term) in each unrestricted sub-sample 2K = number of regressors in both the unrestricted sub-sample regressions (wholesample)

N_1 = number of observations for before financial meltdown period N_2 = number of observations for after financial meltdown period

The results of Chow-test (**vide table 7**) reveals that the F value for DPS (5.60) is significant at 1 % level, hence **H_0^5:** "there is no significant difference in the impact of dividend per share (DPS) on shareholders' wealth (SW) between pre and post financial meltdown periods of **Industry sector** in India" is rejected at 1% level. The F value for DY (2.44) is significant at 5% level, hence **$H_0^{7)}$:** "there is no significant difference in the impact of dividend yield (DY) on shareholders' wealth (SW) between pre and post meltdown periods of **Industry sector** in India" is rejected at 5% level.

Table 7 Results of Chow Test for the difference in the Impact of DP on SW between Pre andPost financial Meltdown Periods for Industry Sector

Variables	Pooled Regression (2003-07, 2009-13)		Regression for Pre Period 2003–07		Regression for Post Period 2009-13	
	Beta (β)	t-value	Beta (β)	t-value	Beta (β)	t-value
MPS = f (DPS, DPS_1)						
Intercept	-68.83	-0.3	-22.05	-0.05	-548.51	-1.94
DPS	399.26**	3.72	2636.12	1.56	423.39**	4.18
DPS_1	441.39**	3.94	-1683.68	-0.76	486.95**	4.63
R^2	0.6286		0.4114		0.7686	
Adjusted R^2	0.6121		0.333		0.7514	
F Value	38.08**		5.24*		44.84**	
DF	2..45		2..15		2..27	
CHOW Test	F Value		DF		p Value	
	5.60**		42		0.0005	
MPS = f (DPO, DPO_1)						
Intercept	1949.14**	5.13	1929.15**	3.9	2373.83**	3.99
DPO	-78.77	-1	-78.61	-0.74	-132.09	-1.18
DPO_1	-21.22	-0.29	-133.73	-1.33	15.08	0.15
R^2	0.1288		0.2079		0.1717	
Adjusted R^2	0.0901		0.1023		0.1103	
F Value	3.33*		1.97 NS		2.80 NS	
DF	2..45		2..15		2..27	
CHOW Test	F Value		DF		p Value	
	1.28 NS		42		0.2891	
MPS = f (DY, DY_1)						
Intercept	1900.23**	5.24	2604.36**	5.39	2286.33**	4.05
DY	-1198.42	-1.06	-7807.08	-1.83	-1946.12	-1.37
DY_1	-642.56	-0.5	-1914.48	-0.8	-19.88	-0.01
R^2	0.1356		0.4529		0.1765	
Adjusted R^2	0.0972		0.3799		0.1155	
F Value	3.53*		6.21**		2.89 NS	
DF	2..45		2..15		2..27	
CHOW Test	F Value		DF		p Value	
	2.44*		42		0.0499	

Source: Computed from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.
**Significant at 1% level; *Significant at 5% level; NS – Not significant.

However, the F value for DPO (1.28) is not significant and it is higher than the 5% level. This shows that there is no significant difference in the impact of DPO on SW betweenpre and post financial meltdown periods. Hence, $H0^6$: "there is no significant difference in theimpact of dividend payout (DPO) on shareholders' wealth (SW) between pre and postfinancial meltdown periods of **Industry sector** in India" is accepted.

Hence, it is concluded that the impact of DP on SW of **Industry sector** is significantly affected by the financial meltdown for the variables DPS and DY and not for the variable

DPO.

Technology sector Impact of DP on SW in Pre and Post Financial meltdown Periods for Technology sector

The results of Chow-test (**vide table 8**) reveals, that there is no significant differencein the impact of DP (DPS, DPO and DY) on SW for pre and post financial meltdown periods for **Technology sector**. The F values for DPS (2.02), DPO (0.26) and DY (0.73) are not significant and they are far higher than the 5% level. Hence, the hypotheses, **H0^5** : "there is no significant difference in the impact of dividend per share (DPS) on shareholders' wealth(SW) between pre and post financial meltdown periods of **Technology sector** in India", **H0^6** : "there is no significant difference in the impact of dividend payout (DPO) on shareholders' wealth (SW) between pre and post financial meltdown periods of **Technology sector** inIndia", and **H0^7** : "there is no significant difference in the impact of dividend yield (DY) on shareholders' wealth (SW) between pre and post financial meltdown periods of **Technology sector** in India" are accepted. That is, the impact of DP (DPS, DPO and DY) on SW is unaffected by the financial meltdown for **Technology sector** in India.

Table 8 Results of Chow Test for the difference in the Impact of DP on SW between Preand Post financial Meltdown Periods for Technology Sector

Variables	Pooled Regression (2003-07, 2009-13)		Regression for Pre Period 2003–07		Regression for Post Period 2009-13	
	Beta (β)	t-value	Beta (β)	t-value	Beta (β)	t-value
MPS = f (DPS, DPS_1)						
Intercept	-46.8	-0.39	179.17	0.78	-195.63	-1.52
DPS	141.26**	4.63	71.04	1.23	190.28**	3.81
DPS_1	80.51**	4.39	76.73**	3.17	72.53	1.43
R^2	0.5984		0.4815		0.726	
Adjusted R^2	0.5805		0.4124		0.7057	
F Value	33.52**		6.97**		35.77**	
DF	2..45		2..15		2..27	
CHOW Test	**F Value**		**DF**		**p Value**	
	2.02^{NS}		42		0.0948	
MPS = f (DPO, DPO_1)						
Intercept	865.51**	5.18	932.96**	3.11	851.74**	3.94
DPO	-7.2	-1.18	-7.9	-0.92	-7.67	-0.79
DPO_1	-3.02	-0.43	-0.99	-0.09	-5.36	-0.56
R^2	0.0616		0.084		0.0629	
Adjusted R^2	0.0199		-0.0382		-0.0065	
F Value	1.48^{NS}		0.69^{NS}		0.91^{NS}	
DF	2..45		2..15		2..27	
CHOW Test	**F Value**		**DF**		**p Value**	
	0.26^{NS}		42		0.9347	
MPS = f (DY, DY_1)						
Intercept	1054.39**	5.94	897.63**	3.2	1198.23**	5.01
DY	-541.04*	-1.99	-902.01	-1.32	-464.44	-1.48
DY_1	47.34	0.18	465.31	0.86	-166.07	-0.5
R^2	0.163		0.1209		0.2314	
Adjusted R^2	0.1257		0.0037		0.1745	
F Value	4.38*		1.03NS		4.06*	
DF	2..45		2..15		2..27	
CHOW Test	**F Value**		**DF**		**p Value**	
	0.73^{NS}		42		0.6047	

Source: Computed from the compiled & edited data from the financial statements of selected firms listed-CMIE-prowess package.
**Significant at 1% level; *Significant at 5% level; NS – Not significant.

11. LIMITATIONS AND SCOPE FOR FURTHER STUDIES

The study is based on secondary data collected from the Centre for Monitoring Indian Economy Private Limited (Prowess CMIE). Therefore, the quality of the study depends uponthe accuracy, reliability, and quality of secondary data source. The analysis has produced

some meaningful inferences and results, and one avenue for future research is to extend the investigation to the other sectors and across sectors.

The present study has used market price per share (MPS) as a proxy for measuring theshareholders' wealth (SW). Further studies may be conducted using the response variableviz., Economic value added (EVA) and Market value added (MVA) to measure the SW.

The study has used research tools like Johansen co-integration test, multiple regressions and Chow test for analyzing the co-integration between DP and SW. Therefore, inclusion of some more appropriate methods of analysis viz., Block Exogeneity Wald test (1943), Bai-Perron test (2003) and Variance decomposition for analysis may add to exploringnew and further inference in the area of research.

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