

INTERRELATIONSHIP BETWEEN CAPITAL STRUCTURE AND DIVIDEND POLICY WITH REFERENCE TO SELECT INDIAN COMPANIES

Rajbinder Kaur*

Prof. Arup Chattopadhyay**

Prof. Debdas Rakshit***

Abstract

Keywords:

Capital Structure;

Dividend Policy;

Interrelationship;

Granger Causality Test;

Panel Data Regression

Technique.

The paper investigates the interrelationship between capital structure and dividend policies using data from 40 BSE listed companies by choosing 4 sample companies from each of 10 industries, namely, automobile, cement, engineering, fertilizer, oil exploration, pharmaceutical, refineries, tea, textile and tyre during the study period 1999-2000 to 2013-14. For analysing the said interrelationship, the study has applied Akaike's Information Criterion (AIC), Granger Causality Test and Panel Data Regression Methodology. From the estimated results of Granger Causality Test, we observe that F-Statistic value using Dividend Payout Ratio as independent variable is significant for 5 sample

* P. hD Research Scholar, Commerce Department, The University of Burdwan, Burdwan -713104, West Bengal, India

**Supervisor, Department of Economics, The University of Burdwan Burdwan – 713104, West Bengal, India

***Supervisor, Department of Commerce, The University of Burdwan Burdwan – 713104, West Bengal, India

companies, while F-Statistic value using Leverage as independent factor is significant for other 3 sample companies. Next, we have estimated two regression equations as per the prescription obtained from Granger Causality Test along with other control variables. In view of both the regression results jointly, we may conclude that Dividend Payout Ratio is statistically significantly and negatively influenced by Leverage, but the converse is not true. But this conclusion is confined to a very limited number of sample companies, while for majority of them we do not get such relation.

1. Introduction

Though a large number of research studies examined the capital structure and dividend policy in an isolated way, these two aspects of financial policy are interrelated and there are a few researchers who actually pay attention to investigate them jointly. In relation to this joint relation, Jensen et al. (1992) reveal that debt and dividend payout decisions are interdependent. They show that when debt policy is considered as dependent variable, it is statistically significant and negatively related to dividend payout decisions in both their study periods, i.e., 1982 and 1987 and when dividend payout decision is considered as dependent variable, it is statistically significant and negatively related to debt policy in 1987 only.

Considering the relation between capital structure and dividend payout policy in a study Chang and Rhee (1990) show that mostly debt financing companies are having higher payout ratio, whereas mostly equity financing companies are having lower payout ratio. In case of other studies, where dividend payout decision is considered as dependent variable, like Gill et al. (2010) show that greater the financing with debt capital, larger the dividend payout ratio, i.e., dividend payout ratio increases due to increase in debt level in capital structure. On the other hand, Aivazian et al. (2003), Al-Kuwari (2009) and Asif et al. (2011) found significant negative relationship between leverage and dividend policy. Other studies, like Mehrani et al. (2011),

Mehta (2012), Alzomaia and Al-Khadhiri (2013) and Maladjian and Khoury (2014) found insignificant influence of leverage on dividend policy.

On the basis of theoretical arguments as well as empirical verifications, it remains very difficult to accept any appropriate relation between capital structure and dividend policy. Actually, the lack of reliable empirical tests and proofs on these issues compelled the researchers to heavily depend on anecdotes to justify their explanations. The scientific procedures for establishing definite relation/theory, if any, in the Indian context in the areas of capital structure and dividend policy, therefore, need empirical verifications.

The present study is a modest attempt to get answer to the unresolved issues on capital structure and dividend policy.

2. Objective of the Study:

The basic objective of the current study is to measure capital structure and dividend policy and also to empirically verify their interrelationship, if any, in the Indian context for selected companies under control variable setting.

3. Hypothesis of the Study:

In conformity with the basic objective of the study the following statistical null hypothesis has been set for testing:

There is no relationship between leverage and dividend payout ratio. Further this no relationship occurs for all companies across industries in the country.

4. Data Base and Research Methodology:

4.1 Data Collection Procedure and the Period under Study:

We have selected a total of 10 industries from manufacturing and plantation sectors. Again, for each industry we have chosen 4 dividend paying sample companies on the basis of highest turnover for 2011 and availability of data for the 15 years of our study period (i.e., from 1999-2000 to 2013-14) for analysing the interrelationship between capital structure and dividend policy.

4.2 Data Source:

The study has employed secondary data collected from corporate database package of 'CAPITALINE 2000'. The collected data have been complied as per the need of the study and analytical technique is applied to interpret the data. Additionally, statistical software packages, namely, EViews 9 SV and STATA 12.1 have been used.

4.3 Measurement of Variable:

The variables under study have been defined and measured using the under formulae as defined in the financial literature. Table-1 and Table-2 represent those variables and their measurements.

TABLE 1: EXPLANATORY VARIABLES RELATED TO LEVERAGE

VARIABLE	MEASURE
DIVIDEND PAYOUT RATIO (DPR)	Ratio of Dividend Per Share to Earnings Per Share
PROFITABILITY (ProfitA)	Ratio of EBIT to Total Assets
SIZE (SizeS)	Natural Logarithm of Net Sales
GROWTH (GR)	Percentage Change in Total Assets
TANGIBILITY (Tan)	Ratio of Fixed Assets to Total Assets
NON-DEBT TAX SHIELD (NDTS)	Ratio of Annual Depreciation Expenses to Total Assets
LIQUIDITY (Liq)	Ratio of Current Assets to Current Liabilities
UNIQUENESS (Uni)	Ratio of Selling Expenses to Sales
INCOME VARIATION (IV)	Natural Logarithm of Standard Deviation of EBIT

TABLE 2: EXPLANATORY VARIABLES RELATED TO DIVIDEND PAYOUT RATIO

VARIABLE	MEASURE
LEVERAGE (LEV)	Ratio of Total Debt to Total Assets
PROFITABILITY (ProfitS)	Ratio of Profit After Tax to Total Shareholders' Funds
SIZE (SizeA)	Natural Logarithm of Total Assets
INVESTMENT OPPORTUNITIES (Inv)	Ratio of Market Value to Book Value
LIQUIDITY (Liq)	Ratio of Current Assets to Current Liabilities
BUSINESS RISK (BR)	Difference Between Operating Profit in the Current Year and Previous Year divided by Operating Profit in the Previous Year

4.4 Granger Causality Test:

From financial theories we do not get any guidance regarding selection of explained and explanatory variables definitely between leverage and dividend payout ratio. But Time Series Econometrics helps us in this regard devising a specialized test termed as Granger Causality Test.

To establish cause-effect relationship between two variables having their time series data Granger prescribes a test popularly known as Granger Causality Test. This test involves estimating a pair of regressions as noted below:

$$Y_t = \sum_{i=1}^n \alpha_i X_{t-i} + \sum_{j=1}^n \beta_j Y_{t-j} + \mu_{1t} \dots\dots\dots \text{Equation (1) and}$$

$$X_t = \sum_{i=1}^n \lambda_i X_{t-i} + \sum_{j=1}^n \delta_j Y_{t-j} + \mu_{2t} \dots\dots\dots \text{Equation (2)}$$

Where, X and Y are two variables under consideration, and μ_1 and μ_2 are two uncorrelated disturbances having constant variance each. Here equation (1) postulates that current value of Y depends on its past values as well as values of X. If this regression gives good fit then it signifies that X is the Granger cause of Y. Similarly, good fit of equation (2) signifies that Y is the Granger cause of X. If both equations give good fit we get two directional causality, i.e., each is the Granger cause of other. Here it is to be noted that good fit implies significance of the parameters related to lagged values of the explanatory variable (say, X) for other as explained variable (say, Y).

The Granger Causality Test is sensitive to the selection of lag structure in the Granger Equation. This lag structure has been selected in our study on the basis of lowest value of Akaike's Information Criterion.

4.5 Panel Data Analysis:

The data structure in our study pertains to panel data which requires Panel Data Regression Analysis. For Panel Data Regression Analysis selection of appropriate model is necessary. In this study, we have used two tests namely, Hausman Specification Test and Breusch Pagan Lagrange Multiplier Test for selection of appropriate model among Fixed-Effects Model (FEM), Random-Effects Model (REM) and Pooled Regression Model. The procedure that we have followed for selection of model is presented in the following Table-3 which is self-explanatory.

TABLE 3: SELECTION OF MODEL

CASE	HAUSMAN SPECIFICATION TEST	BREUSCH PAGAN LAGRANGE MULTIPLIER TEST	SELECTED MODEL
CASE-1	SIGNIFICANT (FEM)	SIGNIFICANT (REM)	FEM
CASE-2	SIGNIFICANT (FEM)	INSIGNIFICANT (POOLED REGRESSION MODEL)	FEM
CASE-3	INSIGNIFICANT (REM)	SIGNIFICANT (REM)	REM
CASE-4	INSIGNIFICANT (REM)	INSIGNIFICANT (POOLED REGRESSION MODEL)	FEM

NOTE: (i) For contradictory results FEM is selected.

(ii) If Hausman Specification Test fails, the conclusion regarding model selection is based on

Breusch Pagan Lagrange Multiplier Test.

5. Results and Analysis:

5.1 Interrelationship between Capital Structure and Dividend Policy using Granger

Causality Test:

This section analyses the interrelationship between capital structure and dividend policy across 40 sample companies using Granger Causality Test. On the basis of lowest value of Akaike's Information Criterion (AIC) [Table - 4] lag structure is selected. Next, we have applied Granger Causality test on the time series data for each company.

TABLE 4: CHOICE OF LAG STRUCTURE ON THE BASIS OF AIC VALUE

COMPANY NAME	LAG 1	LAG 2	LAG 3	LAG 4	CHOSEN LAG STRUCTURE
ASHOK LEYLAND	- 3.178	- 2.455	- 2.312	- 4.409	LAG 4
EICHER MOTORS LTD	- 0.187	- 0.347	- 0.247	- 2.839	LAG 4
FORCE MOTORS LTD	- 2.445	- 2.169	- 1.607	- 2.168	LAG 1
SML ISUZU LTD	- 3.034	- 3.066	2.654	- 11.832	LAG 4
BIRLA CORPORATION LTD	- 4.885	- 4.593	- 4.358	- 5.541	LAG 4
JK LAKSHMI CEMENT LTD	- 5.550	- 7.145	—	—	LAG 2
PRISM CEMENT LTD	- 1.624	- 2.527	- 2.716	- 3.470	LAG 4
SHREE CEMENT LTD	2.064	2.734	- 0.227	- 3.630	LAG 4
BEML LTD	- 1.660	- 1.337	- 1.868	- 4.185	LAG 4
CMI FEP LTD	- 2.237	- 1.873	- 2.483	- 2.984	LAG 4
MANUGRAPH INDIA LTD	- 2.224	- 2.299	- 1.907	- 3.600	LAG 4
PRAJ INDUSTRIES LTD	- 3.877	- 4.127	- 5.412	- 7.476	LAG 4
CHAMBAL FERTILIZERS & CHEMICALS LTD	- 4.129	- 4.136	- 4.780	- 12.569	LAG 4
COROMANDEL INTERNATIONAL LTD	- 4.969	- 4.955	- 5.270	- 8.283	LAG 4

NATIONAL FERTILIZERS LTD	1.294	1.881	- 3.006	- 9.286	LAG 4
RASHTRIYA CHEMICALS & FERTILIZERS LTD	- 2.314	- 1.588	- 1.254	- 3.321	LAG 4
ABAN OFFSHORE LTD	- 2.945	- 3.699	- 3.547	- 5.457	LAG 4
GAIL (INDIA) LTD	- 8.785	- 8.701	- 10.571	- 12.172	LAG 4
HINDUSTAN OIL EXPLORATION COMPANY LTD	- 2.072	- 2.436	- 3.313	- 5.555	LAG 4
OIL INDIA LTD	- 5.832	- 6.020	- 6.327	—	LAG 3
CADILA HEALTHCARE LTD	- 5.317	- 6.498	- 6.158	- 8.521	LAG 4
CIPLA LTD	- 5.747	- 6.187	- 5.554	- 5.823	LAG 2
DR. REDDY'S LABORATORIES LTD	- 2.427	- 3.234	- 4.396	- 7.591	LAG 4
TORRENT PHARMACEUTICALS LTD	- 3.986	- 3.955	- 3.681	- 4.232	LAG 4
BHARAT PETROLEUM CORPORATION LTD	- 4.756	- 4.297	- 4.457	- 8.009	LAG 4
HINDUSTAN PETROLEUM CORPORATION LTD	- 4.314	- 3.958	- 4.621	- 5.715	LAG 4
MANGALORE REFINERY AND PETROCHEMICALS LTD	- 3.127	- 3.741	- 3.164	- 3.804	LAG 4

RELIANCE INDUSTRIES LTD	- 9.000	- 8.978	- 9.084	- 9.807	LAG 4
BOMBAY BURMAH TRADING CORPORATION LTD	- 1.305	- 1.147	- 3.324	—	LAG 3
HARRISONS MALAYALAM LTD	- 4.447	- 3.845	- 3.529	- 5.608	LAG 4
JAY SHREE TEA & INDUSTRIES LTD	- 3.555	- 2.937	- 2.974	- 6.320	LAG 4
TATA GLOBAL BEVERAGES LTD	- 3.623	- 3.659	- 4.282	- 7.400	LAG 4
BOMBAY RAYON FASHIONS LTD	- 3.708	- 3.849	- 3.790	- 43.850	LAG 4
HANUNG TOYS & TEXTILES LTD	- 5.702	- 5.125	- 4.952	- 7.042	LAG 4
NANDAN DENIM LTD	- 2.119	- 2.333	- 2.188	- 9.644	LAG 4
RAYMOND LTD	- 4.564	- 4.247	- 4.495	- 9.039	LAG 4
APOLLO TYRES LTD	- 3.125	- 4.573	- 5.053	- 12.279	LAG 4
BALKRISHNA INDUSTRIES LTD	- 3.705	- 4.484	- 5.531	- 9.653	LAG 4
CEAT LTD	- 1.199	- 0.565	- 2.718	- 2.812	LAG 4
MRF LTD	- 4.354	- 4.226	- 4.022	- 7.279	LAG 4

Note: AIC implies Akaike's Information Criterion whose lowest value is picked up for choosing the lag length.

ABLE 5: COMPANY-WISE ESTIMATED RESULTS OF GRANGER CAUSALITY TEST

NAME OF THE COMPANY	VALUE OF F STATISTIC RELATED TO CONCERNED VARIABLE		RESULT
	DIVIDEND PAYOUT RATIO	LEVERAGE	
ASHOK LEYLAND	0.09814 (0.9731)	8.77413 (0.1049)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
EICHER MOTORS LTD	1.55372 (0.4276)	1.79881 (0.3877)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
FORCE MOTORS LTD	2.09909 (0.1753)	3.52176*** (0.0873)	Dividend Payout Ratio does not Granger cause Leverage. Leverage is the Granger cause of Dividend Payout Ratio.
SML ISUZU LTD	3450.20* (0.0003)	0.20672 (0.9144)	Dividend Payout Ratio is the Granger cause of Leverage. Leverage does not Granger cause Dividend Payout Ratio.

BIRLA CORPORATION LTD	2.27918 (0.3275)	0.24078 (0.8944)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
JK LAKSHMI CEMENT LTD	0.13566 (0.8762)	2.89024 (0.1465)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio
PRISM CEMENT LTD	0.70629 (0.6572)	4.56745 (0.1876)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
SHREE CEMENT LTD	0.90558 (0.5849)	1.45042 (0.4470)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
BEML LTD	0.83128 (0.6101)	2.09794 (0.3479)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
CMI FEP LTD	0.65993 (0.6763)	5.33951 (0.1639)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.

MANUGRAPH INDIA LTD	2.62939 (0.2940)	0.43046 (0.7860)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
PRAJ INDUSTRIES LTD	1.48445 (0.4404)	6.93190 (0.1300)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
CHAMBAL FERTILIZERS & CHEMICALS LTD	3.57004 (0.2306)	0.94282 (0.5730)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
COROMANDEL INTERNATIONAL LTD	0.72355 (0.6503)	0.61493 (0.6958)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
NATIONAL FERTILIZERS LTD	1.38646 (0.4598)	8.51758 (0.1078)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
RASHTRIYA	0.16175 (0.9403)	2.37950 (0.3171)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger

CHEMICALS & FERTILIZERS LTD			cause Dividend Payout Ratio.
ABAN OFFSHORE LTD	2.26189 (0.3293)	0.39367 (0.8060)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
GAIL (INDIA) LTD	2.12078 (0.3452)	0.76858 (0.6329)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
HINDUSTAN OIL EXPLORATION COMPANY LTD	0.69599 (0.6613)	10.5596*** (0.0884)	Dividend Payout Ratio does not Granger cause Leverage. Leverage is the Granger cause of Dividend Payout Ratio.
OIL INDIA LTD	29.6190* (0.0034)	1.02281 (0.4712)	Dividend Payout Ratio is the Granger cause of Leverage. Leverage does not Granger cause Dividend Payout Ratio.
CADILA HEALTHCARE LTD	3.13491 (0.2562)	4.62214 (0.1857)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
CIPLA LTD	3.20349***	1.13488 (0.3682)	Dividend Payout Ratio is the

	(0.0951)		Granger cause of Leverage. Leverage does not Granger cause Dividend Payout Ratio.
DR. REDDY'S LABORATORIES LTD	1.81929 (0.3847)	1.62049 (0.4160)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
TORRENT PHARMACEUTICALS LTD	0.34597 (0.8328)	1.12556 (0.5206)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
BHARAT PETROLEUM CORPORATION LTD	0.73983 (0.6439)	5.53016 (0.1590)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
HINDUSTAN PETROLEUM CORPORATION LTD	0.52755 (0.7364)	1.07388 (0.5344)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
MANGALORE REFINERY AND PETROCHEMICALS LTD	1.87247 (0.3771)	0.76207 (0.6324)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.

RELIANCE INDUSTRIES LTD	0.52013 (0.7400)	0.46272 (0.7690)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
BOMBAY BURMAH TRADING CORPORATION LTD	1.64891 (0.3456)	44.9631* (0.0054)	Dividend Payout Ratio does not Granger cause Leverage. Leverage is the Granger cause of Dividend Payout Ratio.
HARRISONS MALAYALAM LTD	0.23070 (0.9003)	7.41435 (0.1224)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
JAY SHREE TEA & INDUSTRIES LTD	36.6137* (0.0268)	0.22008 (0.9066)	Dividend Payout Ratio is the Granger cause of Leverage. Leverage does not Granger cause Dividend Payout Ratio.
TATA GLOBAL BEVERAGES LTD	2.36410 (0.3187)	8.18201 (0.1119)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
BOMBAY RAYON FASHIONS LTD	2.33762 (0.4512)	7.16908 (0.2723)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.

			Ratio.
HANUNG TOYS & TEXTILES LTD	0.29881 (0.8601)	3.05031 (0.2618)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
NANDAN DENIM LTD	6.28986 (0.1419)	0.63233 (0.6882)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
RAYMOND LTD	1.01620 (0.5508)	0.73074 (0.6475)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
APOLLO TYRES LTD	6.31210 (0.1414)	1.63071 (0.4143)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.
BALKRISHNA INDUSTRIES LTD	33.6742** (0.0290)	0.13244 (0.9561)	Dividend Payout Ratio is the Granger cause of Leverage. Leverage does not Granger cause Dividend Payout Ratio.
	1.47935 (0.4414)	0.08629 (0.9783)	Dividend Payout Ratio does not Granger cause Leverage.

CEAT LTD			Leverage does not Granger cause Dividend Payout Ratio.
MRF LTD	6.88457 (0.1308)	0.67655 (0.6693)	Dividend Payout Ratio does not Granger cause Leverage. Leverage does not Granger cause Dividend Payout Ratio.

Note: For the significant value of F-Statistic, the variable concerned will be the Granger cause of other (i.e., variable concerned will be the independent variable and another variable will be the dependent variable).

From the estimated results of Granger Causality Test [presented in Table-5] we see that out of 40 dividend paying sample companies, F-Statistic value using Dividend Payout Ratio as independent variable is significant for 5 sample companies [viz. SML ISUZU Ltd, Oil India Ltd, Cipla Ltd, Jay Shree Tea & Industries Ltd and Balkrishna Industries Ltd], while F-Statistic value using Leverage as independent factor is significant for other 3 sample companies [namely, Force Motors Ltd, Hindustan Oil Exploration Company Ltd and Bombay Burmah Trading Corporation Ltd]. Therefore, out of 40 dividend paying sample companies we observe that dividend payout ratio is explanatory variable for leverage in 5 cases and leverage is explanatory variable for dividend payout ratio in 3 cases. From sample observations we see that for 32 companies (out of 40 companies) we do not get any statistically significant relationship between dividend payout ratio and leverage, as neither leverage is the granger cause of dividend payout ratio nor dividend payout ratio is the granger cause of leverage.

5.2 Interrelationship between Capital Structure and Dividend Policy using Panel Data Regression Technique:

To examine empirically the relationship between dividend payout ratio and leverage we have next estimated the regression equation as per the prescription obtained from Granger Causality Test along with other control variables. More specifically, for 5 sample companies we have estimated the following regression equation: -

$$\text{Lev}_{it} = \alpha + \beta_1 \text{DPR}_{it} + \beta_2 \text{ProfitA}_{it} + \beta_3 \text{SizeS}_{it} + \beta_4 \text{GR}_{it} + \beta_5 \text{Tan}_{it} + \beta_6 \text{NDTS}_{it} + \beta_7 \text{Liq}_{it} + \beta_8 \text{Uni}_{it} + \beta_9 \text{IV}_{it} + \epsilon_{it}$$

Where, apart from Dividend Payout Ratio (DPR) all other independent variables are used here as control variables and ϵ_{it} is the disturbance term which is a white noise. Here α 's and β 's are regression parameters.

Similarly, for other set of 3 sample companies we have empirically estimated regression equation with control variables, where Leverage is found to be Granger cause of Dividend Payout Ratio (DPR): -

$$\text{DPR}_{it} = \alpha + \beta_1 \text{Lev}_{it} + \beta_2 \text{ProfitS}_{it} + \beta_3 \text{SizeA}_{it} + \beta_4 \text{Liq}_{it} + \beta_5 \text{Inv}_{it} + \beta_6 \text{BR}_{it} + \epsilon_{it}$$

Where, apart from Leverage (Lev) all other independent variables are control variables and ϵ_{it} is the white noise disturbance term. Here α 's and β 's are regression parameters.

Further, ProfitA_{it} denotes Profitability of i^{th} sample company over period t ($t = 1, 2, \dots, 15$), SizeS_{it} denotes Size of i^{th} sample company over period t ($t = 1, 2, \dots, 15$), GR_{it} denotes Growth of i^{th} sample company over period t ($t = 1, 2, \dots, 15$), Tan_{it} denotes Tangibility of i^{th} sample company over period t ($t = 1, 2, \dots, 15$), NDTS_{it} denotes Non-Debt Tax Shield of i^{th} sample company over period t ($t = 1, 2, \dots, 15$), Liq_{it} denotes Liquidity of i^{th} sample company over period t ($t = 1, 2, \dots, 15$), Uni_{it} denotes Uniqueness of i^{th} sample company over period t ($t = 1, 2, \dots, 15$), IV_{it} denotes Income Variation of i^{th} sample company over period t ($t = 1, 2, \dots, 15$), ProfitS_{it} denotes Profitability of i^{th} sample company over period t ($t = 1, 2, \dots, 15$), SizeA_{it} denotes Size of i^{th} sample company over period t ($t = 1, 2, \dots, 15$), Inv_{it} denotes

Investment Opportunities of i^{th} sample company over period t ($t = 1, 2, \dots, 15$) and BR_{it} denotes Business Risk of i^{th} sample company over period t ($t = 1, 2, \dots, 15$).

These two regression equations are estimated using Panel Data Regression Technique, the detail of which was explained earlier in methodology section.

The estimated regression equations are analysed below: -

In case of first set of 5 sample companies (where Dividend Payout Ratio is the Granger cause of Leverage) we have applied Breusch and Pagan Lagrange Multiplier test and its test statistic value is 0.00 which is statistically insignificant. Therefore, here the Pooled Regression Model is the appropriate model for choice. On the other hand, the asymptotic assumptions of the Hausman Specification test for these sample companies are not satisfied, that means, for making selection between Random-Effects Model and Fixed-Effects Model, here the Hausman Specification test remains ineffective. Therefore, taking into account both the Breusch and Pagan Lagrange Multiplier test and the Hausman Specification test, we have chosen the Pooled Regression Model. The estimated regression results of the Pooled Regression Model are depicted as follows:

$$\begin{aligned} Lev_{it} = & 0.4182^{***} + 0.0477 DPR_{it} - 0.6570^* ProfitA_{it} + 0.0381 SizeS_{it} + 0.0028^* GR_{it} + 0.1644 Tan_{it} \\ & (0.2212) \quad (0.0906) \quad (0.1638) \quad (0.0462) \quad (0.0007) \quad (0.1220) \\ & - 0.2753 NDTs_{it} + 0.0277 Liq_{it} + 0.1001 Uni_{it} - 0.1122^* IV_{it} \dots \dots \dots \text{Equation (1)} \\ & (0.1914) \quad (0.0216) \quad (0.2730) \quad (0.0422) \\ \\ R^2 = & 0.6931^* \\ & [16.06] \end{aligned}$$

The estimated regression results suggest that profitability and income variation have negative and statistically significant influence on leverage and growth has positive and statistically significant impact on leverage. On the other hand, dividend payout ratio, size, tangibility, non-debt tax shield, liquidity and uniqueness are statistically insignificant. The overall significance of the model is determined by F statistic value which is statistically significant at 1% level. Therefore, the estimated Pooled Regression Model suggests overall good fit. From this statistical analysis, however, we could not establish any significant causal relation between Leverage and Dividend Payout Ratio.

For the other set of 3 sample companies (where Leverage is the Granger cause of Dividend Payout Ratio), we have estimated the Breusch and Pagan Lagrange Multiplier test which has given a test statistic value of 0.00 with probability value of 1.0000, signifying that it is statistically insignificant. As a result, Pooled Regression Model is preferred over Random-Effects Model. Further the test statistic value provided by the Hausman Specification test is 40.26 which is statistically significant at 1% level, that means the Fixed-Effects Model is appropriate here. By comparing the results of both the tests we have found contradiction in selecting appropriate model. To resolve this issue, we have applied the Fixed-Effects Model in consistency with the econometric practices. The estimated regression equation of the Fixed-Effects Model is as follows: -

$$\begin{aligned} \text{DPR}_{it} = & -0.6182 - 1.1496^* \text{Lev}_{it} - 0.2718 \text{ProfitS}_{it} - 0.0052 \text{SizeA}_{it} - 0.0434 \text{Liq}_{it} + 0.1563^* \text{Inv}_{it} \\ & (0.4530) \quad (0.2823) \quad (0.1768) \quad (0.0614) \quad (0.0397) \quad (0.0508) \\ & - 0.00011 \text{BR}_{it} \dots\dots\dots \text{Equation (2)} \\ & (0.00008) \\ \\ & R^2 = 0.4304^* \\ & [4.41] \end{aligned}$$

The estimated regression analysis indicates that investment opportunities is positively and statistically significantly related to dividend payout ratio, whereas, leverage is negatively and statistically significantly associated with dividend payout ratio. On the other hand, profitability, size, liquidity and business risk are statistically insignificant. The overall explanatory power of selected independent variables is measured by F statistic value (which is 4.41 drawn from R^2 value of 0.4304) which is statistically significant at 1% level. Therefore, Fixed-Effects Model gives us overall good fit. Hence, Dividend Payout Ratio for this set of sample companies decreases due to increase in their Leverage and vice versa.

6. Conclusion:

In view of both the regression results jointly, we may conclude that for a few sample companies Dividend Payout Ratio is statistically significantly and negatively influenced by Leverage, but the converse is not true. Further among eight control variables we get significant relation with only three variables, namely profitability (supporting Pecking Order Theory), income variation

(supporting Pecking Order Theory and Trade-Off Theory) and growth (supporting Pecking Order Theory) in case of leverage regression equation and only one variable, namely, investment opportunities (supporting Signalling Theory) in case of dividend payout ratio regression equation. However, there remain a majority of sample companies for which no such relationship between Dividend Payout Ratio and Leverage is observed. However, one should undertake such type of study in the context of a larger sample size before drawing any valid conclusion.

References

1. Aivazian, A., Booth, L., & Cleary, S. (2003). *The Journal of Financial Research*, 26(3), 371-387.
2. Al-Kuwari, D. (2009). Determinants of the dividend policy in Emerging Stock Exchanges: The case of GCC countries. *Global Economy & Finance Journal*, 2(2), 38-63.
3. Alzomaia, T.S., & Al-Khadhiri, A. (2013). Determination of dividend policy: The evidence from Saudi Arabia. *International Journal of Business and Social Science*, 4(1), 181-192.
4. Asif, A., Rasool, W., & Kamal, Y. (2011). Impact of financial leverage on dividend policy: Empirical evidence from Karachi Stock Exchange-listed companies. *African Journal of Business Management*, 5(4), 1312-1324.
5. Chang, R. P., & Rhee, S. G. (1990). The impact of personal taxes on corporate dividend policy and capital structure decisions. *Financial Management*, 19(2), 21-31.
6. Gill, A., Biger, N., & Tibrewala, R. (2010). Determinants of dividend payout ratios: Evidence from United States. *The Open Business Journal*, 3, 8-14.
7. Jensen, G.R., Solberg, D.P., & Zorn, T.S. (1992). Simultaneous determination of insider ownership, debt, and dividend policies. *Journal of Financial and Quantitative Analysis*, 27(2), 247-263.
8. Mehta, A. (2012). An empirical analysis of determinants of dividend policy: Evidence from the UAE companies. *Global Review of Accounting and Finance*, 3(1), 18-31.
9. Maddala, G.S. (2007). *Introduction to Econometrics* (3rd ed.). India: Wiley India Private Limited.

10. Maladjian, C., & Khoury, R. E. (2014). Determinants of the dividend policy: An empirical study on the Lebanese listed banks. *International Journal of Economics and Finance*, 6(4), 240-256.
11. Mehrani, S., Moradi, M., & Eskandar, H. (2011). Ownership structure and dividend policy: Evidence from Iran. *African Journal of Business Management*, 5(17), 7516-7525.

ANNEXTURE

LIST OF SELECTED COMPANIES ACROSS THE INDUSTRIES

INDUSTRY	SAMPLE COMPANIES
AUTOMOBILE	Ashok Leyland Ltd.
	Eicher Motors Ltd.
	Force Motors Ltd.
	SML ISUZU Ltd.
CEMENT	Birla Corporation Ltd.
	JK Lakshmi Cement Ltd.
	Prism Cement Ltd.
	Shree Cement Ltd.
OIL EXPLORATION	Aban Offshore Ltd.
	GAIL (India) Ltd.
	Hindustan Oil Exploration Company Ltd.
	Oil India Ltd.
PHARMACEUTICAL	Cadila Healthcare Ltd.
	Cipla Ltd.
	Dr. Reddy's Laboratories Ltd.
	Torrent Pharmaceuticals Ltd.
TEXTILE	Bombay Rayon Fashions Ltd.
	Hanung Toys and Textiles Ltd.
	Nandan Denim Ltd.
	Raymond Ltd.
LARGE HEAVY ENGINEERING	BEML Ltd.
	CMI FPE Ltd.

	Manugraph India Ltd.
	Praj Industries Ltd.
FERTILIZER	Chambal Fertilizers and Chemicals Ltd.
	Coromandel International Ltd.
	National Fertilizer Ltd.
	Rashtriya Chemicals and Fertilizers Ltd.
REFINERIES	Bharat Petroleum Corporation Ltd.
	Hindustan Petroleum Corporation Ltd.
	Mangalore Refinery and Petrochemicals Ltd.
	Reliance Industries Ltd.
LARGE TYRES	Apollo Tyres Ltd.
	Balkrishna Industries Ltd.
	CEAT Ltd.
	MRF Ltd.
LARGE TEA	Bombay Burmah Trading Corporation Ltd.
	Harrisons Malayalam Ltd.
	Jay Shree Tea & Industries Ltd.
	Tata Global Beverages Ltd.