

# DETERMINANTS OF CORPORATE DIVIDEND POLICY IN INDIA: A DYNAMIC PANEL DATA ANALYSIS

**Brahmaiah B, ICFAI Business School  
Palamalai Srinivasan, Xavier Institute of Management & Entrepreneurship  
Sangeetha R, Christ University**

## ABSTRACT

*The present study empirically examines the determinants of dividend policy of National Stock Exchange (NSE) listed firms in India, using dynamic panel data model for the sample of 95 NSE listed firms with continuous dividend payments from 2012/2013 to 2017/2018. The empirical results reveal that profitability, liquidity, leverage, risk, size of the firm and inflation are the major determinants of dividend policy of selected NSE listed firms in India. Findings deduced from empirical evidence bears testimony to the fact that profitability, liquidity, size of the firm and inflation have significant negative impact on dividend policy of the selected NSE firms covered by the study. These findings seem contradictory to the expected outcome contained in the existing literature on the Indian context. The risk variable tends to have negative and significant impact, which is line with the existing literature. Besides, the lagged dividend, investment opportunities, taxation and yield curve do not play significant role in determining the dividend policy.*

**Keywords:** Dividend Policy, Determinants, Dynamic Panel Data Estimation, India.

## INTRODUCTION

As evidenced by information and analysis contained in the available financial literature, the behaviour of dividend policy is most debatable issue in the context of developed and emerging markets. In his seminal paper entitled “the Dividend Puzzle”, Black (1976) concluded that “the harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just do not fit together”. Since then, several research studies have emerged on the factors that influence a firm’s decision regarding its dividend policy and whether the dividend policy affects the value of a firm and yet the famous dividend puzzle remain unsolved. It has been argued that dividend payments may results in double taxation of income as it is paid from after-tax profits of the corporate and also shareholders have to pay income tax on dividends. Besides, the dividend payments are considered to be a partial liquidation of the corporate. The enterprise value is negatively associated with the dividend payments. In other words, the enterprise value of a firm would decrease with respect to dividend amount paid by a firm. As Miller & Modigliani (1961) irrelevance theory emphasized that the value of the firm is depends upon its fundamental earning capacity and its investment decision, regardless of how it distributes the income, hence the dividend payment become worthless.

It has been stated that the stock price of the firm would fall equivalently to the dividend amount, paid by the firm over the course of the particular trading day (Campbell & Beranek, 1955; Durand and May, 1960; Elton & Gruber, 1970). Campbell & Beranek (1955) and Durand & May (1960) reported that the size of the average price decrease on the ex-dividend day, relative to the dividend amount. Further, Elton & Gruber (1970) estimated the drop-off ratio

averages 0.78 for 4,148 observations between April 1966 and March 1967 and concluded that the dividend yield is positively associated to the drop-off ratio. Miller & Modigliani (1961) irrelevance theory emphasized that dividend policy is irrelevant and do not affect the firm's value or its stock price under the perfect market assumptions because a rational investor should regularly prefer higher capital gain than the dividend yield. However, the capital markets are imperfect in real world. In contrast to the irrelevance theory, Baker & Powell (1999) conducted a survey among 603 Chief Financial Officers of US firms and showed that dividend policy has impact on value of the firms. Moreover, Lintner's (1956) Bird-in-Hand theory stated that dividend payments are positively associated with the value of the firm. He suggested that investors desire to have a bird in the hand (dividend), rather than two in the bush (capital gains), implying that investors prefer dividend paying shares since dividend payment from a stock is less uncertain than the promise of a capital gain in the future. He found that US firms adjust their dividends smoothly to sustain a target long run pay-out ratio.

The Signalling Theory stated that announcement of increased dividend payments by a firm provides strong positive signals in the presence of information asymmetry about the bright future prospects of the firm or higher cash flows in the future (Akerlof, 1970; Bhattacharya, 1979). Besides, the agency cost theory emphasized that dividend payment would assist to solve the agency problem. Easterbrook (1984) stated that the financial institutions are providing credits to the firm so credit institutions are monitoring the management whether they are able to repay its debt obligations. Hence, the shareholders are ready to pay more taxes as they incur less cost on monitoring the activities of the management to ensure behaviour that maximizes shareholder value. Such monitoring would produce positive cash flows and thereby generating profits. Recent theory included to the dividend puzzle is the Life-Cycle Theory (DeAngelo et al., 2006), which states that the amount of dividends paid by a firm depends upon its business life cycle phase. Several mature firms are desire to pay higher dividend as they reap more profit with a small number of investment opportunities. Young and high growth firms target more towards growth and have greater investment opportunities but with low and hesitant profits.

Several theories have been established to elucidate the association between dividend policy and the value of a firm. Based on the theoretical arguments, there are various questions which found to be unsettled and still subject to controversial, viz. Why do firms pay dividends and why do shareholders pay attention to dividend? What are the factors that determine the dividend decision of a firm? Whether the dividend policy affects the value of a firm? Considerable empirical research studies have been undertaken to seek the solutions for these research questions with reference to developed and emerging economies, especially in the Indian context, however the evidences seem to be ambiguous. Kumar (2003) examined the relationship between ownership structure, corporate governance and dividend policy in India and found that ownership is one of the important variables that influence dividend policy. Pandey & Bhat (2004) showed that the restricted monetary policies have significant influence on the dividend behaviour of Indian firms, causing about 5-6 percent reduction in the pay-out ratios. Mahakud (2005) found a positive association of past year's dividend, profits, sales and size of the firm with that of corporate dividends. The debt to equity ratio and the institutional ownership has negative impact on the dividend payment decisions. Kumar (2006) observed that investment opportunity, earnings, corporate and directors' ownership have significant positive impact and debt-to-equity ratio and institutional ownership have significant negative impact on pay-out ratio of Indian companies. He found no evidence in support of any relationship between dividend policy and foreign ownership. Kanwal & Kapoor (2008) found that cash flow, beta of the firm

and profit are the major determinants of pay-out ratio of Indian IT companies. Kapoor et al. (2010) showed that profitability is a primary determinant factor for dividend distribution in the Indian FMCG sector. Devaki & Kamalaveni (2012) concluded that institutional shareholding has a greater influence on determining dividend pay-out policy of the Indian corporate hotels. Using a sample of 20 listed IT companies of National Stock Exchange (NSE), Azhagaiah & Gejalakshmi (2014) identified that price earnings ratio, debt equity ratio and earnings per share significantly and positively influences the dividend policy. Devanadhen & Karthik (2015) examined the factors influencing the dividend decisions of Indian commercial banks and found that profitability and liquidity have a negative effect on dividend pay-out whereas Risk is found to have a positive effect on dividend pay-out. Factors like size, leverage and growth opportunities are unrelated to dividend pay-out of the listed Indian commercial banks as per their evidences. Velmurugan (2015) found that dividend declaration in Indian fertilizer industry is associated with previous year dividend, current year depreciation and current year profit after tax, current year sales and previous year cash flow. Labhane & Mahakud (2016) identified that investment opportunity, financial leverage, size of the company, business risk, firm life cycle, profitability, tax and liquidity are the major determinants of the dividend policy for Indian companies. Most recently, Das (2017) revealed that although leverage is an important determinant of dividends of Bombay Stock Exchange (BSE-500) companies in India, size is not.

In the context of India, the earlier studies employed cross-sectional analysis (Tobit, Logit and Probit models) and static panel analysis (fixed and random effect models) to explore the determinants of corporate dividend policy. Dividend decisions are dynamic in nature and could be modelled as such. However, the widely used static panel data models do not include the lagged dependent variable as independent variables in levels. Because the lags of the level dependent variables are found correlated with the error terms under the fixed and random effect models, hence the estimates become inconsistent and inefficient due to the existence of endogenous variables among the independent variables. Besides, the static panel data models capture the firm-specific and time-effects, but fail to elucidate the impact of adjustment cost and floatation costs on firms financing and dividend sharing decisions since the models restrict the time-lag effects by assuming that lagged periods have no impact on the current adjustments. If the dependent and independent variables reflects significant time-lag effects, it is anticipated that the lagged values of the variables to adjust these costs to determine the optimum dividend pay-outs. Thus, the present study employed dynamic panel data model i.e., Generalized Method of Moments (GMM) to examine the determinants of corporate dividend payments in India.

The liberal foreign investment regime since 1991 has engendered considerable interest among foreign investors, making India one of the fastest growing destinations for global foreign direct investment. Due to the entry of foreign firms, the domestic firms are facing vigorous competition and widened their opportunity of claiming funds by framing better dividend policy to attract investors who have wide range of investment alternatives in the post liberalisation period. Therefore, it becomes imperative task for the corporate executives of Indian firms to design suitable dividend policy that reflects the expectations and preferences of investors, by identifying the significant factors that influences the dividend pay-out decisions. In this backdrop, the present study attempts to examine the determinants of dividend policy for Indian firms during the period 2012/2013 to 2017/2018. The rest of the article is organized in the following sequence: starting with a discussion of methodology of the study. The final two sections present the empirical findings and the concluding remarks respectively.

S. No.	Variables	Measure	Expected Relationship/Sign with Dividend Yield
1	Dividend Yield (DY)	It is calculated as the dividend per share by the market price per share	-/-
2	Lagged Dividend Yield (DY <sub>t-1</sub> )	One year lagged dividend yield (previous dividend yield)	+
3	Profitability (ROE)	It is measured by the Return on Equity (ROE) and calculated as the net income by the market total equity	+/-
4	Liquidity Ratio (CR)	It is measured by the current ratio and calculated as the ratio of current assets to current liabilities	+/-
5	Leverage Ratio (DE)	It is measured by the Debt-Equity ratio and calculated as the ratio of total debt to total equity	+/-
6	Risk (PE)	It is measured by the Price-Earnings ratio and calculated as the price of share by the earnings per share	-
7	Firm Size (MCAP)	It is measured as the natural log of market capitalization	+/-
8	Investment Opportunities (TOBINQ)	It is calculated as the ratio of total market value of firm to total asset value	-
9	Taxation (TAX)	It is a measure of tax effect and calculated by the ratio of corporate tax to Earnings Before Tax (EBT)	+/-
10	Yield Curve of Interest Rates (YC)	It is measured as the difference between the call/notice one rates and the long term lending rates for term greater than five years for the fiscal year-end	-
11	Consumer Price Index (CPI)	It is a measure of inflation	-

## METHODOLOGY

The present study employs Arellano & Bond (1991) dynamic panel data model for first difference equation to eliminate the firm-specific effect. The specification of the model is followed as:

$$\begin{aligned}
 DY_{it} - DY_{it-1} = & \beta(DY_{it-1} - DY_{it-2}) + \chi(ROE_{it} - ROE_{it-1}) + \psi(CR_{it} - CR_{it-1}) \\
 & + \delta(DE_{it} - DE_{it-1}) + \gamma(PE_{it} - PE_{it-1}) + \omega(MCAP_{it-1} - MCAP_{it-2}) + \\
 & \theta(TOBIQ_{it} - TOBIQ_{it-1}) + \Gamma(TAX_{it} - TAX_{it-1}) \\
 & + \tilde{\Theta}(YC_{it} - YC_{it-1}) + \tilde{\Theta}(CPI_{it} - CPI_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1}) \\
 & i=1, \dots, N; t=1, \dots, T
 \end{aligned} \tag{1}$$

Where, DY is dividend variable, ROE, CR, DE, PE, MCAP, TOBIQ and TAX are the firm characteristics variables and YC and CPI are the macroeconomic variables,  $\beta$ ,  $\chi$ ,  $\psi$ ,  $\delta$ ,  $\gamma$ ,  $\omega$ ,  $\Theta$ ,  $\Gamma$ ,  $\tilde{\Theta}$  and  $\tilde{\Theta}$  are parameters to be estimated and  $\varepsilon$  is error term. Table 1 furnishes the summary of the measurements of the variables on the determinants of dividend policy and their anticipated relationship with dividend yield.

The consistency of the GMM estimator depends both on the validity of the assumption that the error term does not exhibit serial correlation and on the validity of the instruments. The

study employs two tests suggested by Arellano & Bond (1991) to test these assumptions. The first test is a Hansen J test of over-identifying restrictions, which evaluates the overall validity of the instruments by analysing the sample analogue of the moment conditions used in the estimation method. Secondly, the Arellano & Bond (A-B) test for AR(1) and AR(2) examines the assumptions of no serial correlation in the error terms.

## **MEASUREMENT OF DIVIDEND POLICY AND ITS DETERMINANTS**

In order to investigate the factors determining the corporate dividend policy, the study used dividend yield as the measurement of dividend policy. Dividend yield depicts the association between cash dividend and the market price of the firm's equity and thus reflects in return that investors expect to earn for the equities they hold (Berk & DeMarzo, 2014). The Signalling theory suggests that the firms would employ dividend yield to reflect its dividend policy and they can impel a positive signal to investors by having a higher dividend yield. Moreover, the dividend yield is used in the previous studies such as Friend & Puckett (1964), Black & Scholes (1974), Litzenberger & Ramaswamy (1979), Miller & Scholes (1982) and Labhane & Mahakud (2016).

### **Lagged Dividend Yield (DY<sub>t-1</sub>)**

The one year lagged dividend yield is included along with more potential determinants of dividend policy to empirically examine the signalling cash flow hypothesis. Lintner (1956) and the recent cash-flow signalling models stated that firms attempt to preserve steady dividends, creating persistent pattern over time. If a firm prefers stability of dividend payments, it may consider the past year's dividend rate and can act accordingly. Therefore, the positive association between the present dividend yield and its lagged value is anticipated.

### **Profitability (ROE)**

Pecking order theory stated that firms will pay a lower dividend and retain more earnings for their expansion. However, Fama & French (2001) showed that the large profit making firms with steady profitability pays higher dividend as compared to smaller and fewer profitable firms. Therefore, the expected relationship between the profitability and dividend yield is indeterminate. For measuring profitability, the return on equity (ROE) is employed in the study and is more appropriate as it measures a firm's profitability and efficiency in generating return to shareholders. The ROE is used in the earlier studies such as DeAngelo et al. (1992), Nissim & Ziv (2001), Aivazian & Booth (2003), Kania & Bacon (2005) and Fraser & Ormiston (2016).

### **Liquidity (CR)**

Liquidity of a firm occupies a dominant role in dividend payment decision. The firms may generate profits but suffer from insufficient liquid cash to declare dividends. Hence, it is anticipated that the high liquid firm would pay higher dividend due to the excess amount of cash. The current ratio is employed to evaluate the liquidity position of a firm and a positive relation between the current ratio and dividend pay-out ratio is expected (Ho, 2003) and Kania & Bacon (2005). On the other hand, if the cash paid out to investors in the form of dividends will reduce cash on hand to the firm, thereby affecting liquidity position of the firm and thus total assets and

the firm's net worth. This perception may result in paying fewer dividends to the shareholders. Therefore, the expected relationship between the liquidity and dividend yield is indeterminate.

### **Leverage (DE)**

A firm's leverage is considered to be an important factor for the dividend policy decisions. Since debt over equity indicates the proportion that is financed by creditors relative to shareholders, the study employed debt-equity ratio to measure leverage of a firm. The higher the firm is financed with debts, the lower the dividend pay-out due to debt covenants (Ho, 2003 and Franklin & Muthusamy, 2010). Moreover, Rozeff (1982) showed that firms with high leverage ratio have high fixed payments for using external financing and thus, higher the leverage ratio, the lower the opportunity for dividend as a consequence leverage is negatively related to dividends. This explanation is in accordance with the agency cost theory of dividend policy. In contrast, a profitable firm that generates higher rate of return than it is paying for borrowed funds can use higher levels of debts in their capital structures to take an advantage of debt tax shield at the expense of creditors. Therefore, the firm's ability to pay dividends is depending upon the optimal capital structure, i.e., how the firm divides its cash flows between debt payments which is a fixed component and dividends-a residual component. Moreover, the profitable firms have greater need for external financing and therefore to insure access to external equity capital the firm may be motivated to establish a good reputation with shareholders through higher dividend, as a consequence leverage is positively related to dividends. Therefore, the anticipated association between financial leverage, measured by debt-equity ratio and dividend yield is indeterminate.

### **Risk (PE)**

According to Fama & French (1998), the higher P/E ratio implies investor's anticipation of higher earnings growth in the future compared to firms with lower P/E ratio. High P/E ratio may be associated with low risk and higher pay-out ratios, whereas low P/E ratio with high risk and lower pay-outs ratios. This explanation is in line with the studies of agency theory of dividend policy. Hence, the P/E ratio is considered as a proxy for risk (Mehta, 2012) and negative relation is expected between risk and dividend yield (Friend & Puckett, 1964; Jensen et al., 1992; Aivazian & Booth, 2003; Amidu & Abor, 2006; & Mehta, 2012).

### **Firm Size (MCAP)**

Generally, the larger firms have higher proportion of institutional shareholdings and as a result they have easy access to capital which leads to pay them higher dividend. Besides, the larger firms need to pay more dividends in order to reduce the agency problem between the managers and the shareholders (Labhane & Mahakud, 2016). However, the firm size is negatively related to dividend payment decisions because the larger firms tend to have greater reinvestment opportunities and pay lesser dividend (Ahmed & Javed, 2009 & Ramli, 2010). The natural log of market capitalization of the firm is considered as proxy for firm size and the anticipated relationship between firm size and the dividend yield is indeterminate.

### **Investment Opportunities (TOBINQ)**

The investment opportunities are measured through Tobin's Q which was introduced by Tobin (1969). The ratio evaluates the market value of a firm to the replacement cost of the firm's physical assets. Tobin's Q reflects expectations about future earnings and market perceptions about the value of the firm. Firm's demand of funds for supplementary investments is characterized by a high Tobin's Q as a proxy for the firm's growth opportunities and has a negative impact on dividend yield. The study employs Tobin's Q as a measurement for investment opportunities which is in line with John & Lang (1991), Yoon & Starks (1995) and Knyazeva & Knyazeva (2011).

### **Taxation Effect (TAX)**

The proponents of traditional theory on taxation stated that a reduction in dividend tax can restrict the capability of firms to engage in inter-temporal tax arbitrage and therefore increase in dividend payments. Besides, the increase in firm's tax liability would result in reduction in the dividend yield. On the other side, the 'new theory' propounded by King (1977) emphasized that the mature firms, those solely depend on retained earnings, are able to retain their profits to meet their equity financing needs and then dispense the remaining profits as dividends, even when there is double taxation. Therefore, dividend taxes would be irrelevant to the firms' dividend policies. Therefore, the anticipated relationship between the tax effect represented by the ratio of corporate tax to profit before income tax and the dividend pay-out ratio is indeterminate.

### **Yield Curve of Interest Rates (YC)**

It has been stated that rigid monetary policies raise the cost of banks' capital and therefore discourage firms from bank borrowings (Kashyap et al., 1993). Besides, Oliner & Rudebusch (1996) asserted that lenders would not be funding low-quality firms under such circumstances. In this line of arguments, Pandey & Bhat (2004) showed that tightened monetary policy has significant influence on the dividend pay-out behaviour of Indian firms. The YC variable is measured as the difference between the call/notice money rates and the long term rates for term more than 5 years for the fiscal year-end. The negative association on the yield curve differential variable is expected, as the term structure of interest rate increases, relative cost of debt rises and therefore has negative impact on dividend distribution.

### **Inflation (CPI)**

The negative association between inflation and dividend yield is anticipated. The rise in real general prices generates upward pressure on firms' demands for funds, thus raise leverage and restrain dividends. Besides, the high inflationary situation tends to increase the leverage of the firm and thus results in lower dividend yield because of high fixed financial commitments.

## **DATA**

For the study, the sample of 95 firms with continuous dividend payments from 2012/13 to 2017/18 has been selected on the basis of availability of database and those firms are listed on the National Stock Exchange (NSE). The data on some key variables are not available for all the

listed firms and hence our panel data is unbalanced. The list of selected NSE listed firms is provided in the Appendix I. The study covers the annual data for the period from 2012/2013 to 2017/2018 and the necessary information for empirical analysis have been obtained from the Emerging Markets Information Service (EMIS) database provided by the Euromoney Institutional Investor Company, Europe and the various reports and publications of Reserve Bank of India (RBI), India.

## RESULTS AND DISCUSSION

Table 2 depicts descriptive statistics for all variables used in the study. It has been observed that the average dividend yield of sample firms is 0.0124, implying that investors on these firms tend to receive 1.24 percent of dividend yield. Investors can receive maximum of 30.23 percent and minimum of 0.03 percent dividend yield during the sample period. The average return on equity (ROE) across the sample firms is found to be 0.0474 percent with a range of -44.070 and 1.7430. Overall, the worst ROE observed is -44.070, implying that firms had a net loss accounting for 44.07 percent of its equity. The current ratio (CR) has a mean value of 2.16, indicating that sample firms' current asset is 2.16 times of its current liabilities. A current ratio below 1 would imply that a firm in question would be unable to pay back its obligations. In our case, on an average, the firms have better financial capability. The debt-equity ratio (DE) has a mean value of 0.9864, implying that the average total debt of sample firms is 98.64 percent of its total equity. This higher debt-equity ratio indicates a higher risk and more aggressive financial strategies of different sized firms. The sample firms have an average price-earnings ratio (PE) of 51.14. The minimum value is found to be negative (-258.46) and the maximum value is 22222.2, implying that the risk conditions of the sample listed firms varies. The log of market capitalisation (MCAP) has a mean value of 12.564 and the maximum and minimum values ranges between 15.610 and 7.4752 respectively. This implies that the sample firms include small, medium and big caps and these firms found to be vary in terms of their share price and number of outstanding shares. The average Tobin's Q value of the sample firms is 1.4210, implying that, on an average, a firm's market value (MV) is 1.4 times of its total assets. Since Tobin's Q is higher than 1, it shows that sample firms have more investment opportunities. The wider range of Tobin's Q indicates that firms have different investment opportunities. The average value of corporate tax with respect to profit before income tax is 0.11 percent for the sample firms and the mean value of yield curve variable is negative, implying that call/notice money rates are relatively less than the long term rates. The inflation (CPI) variable has a mean of 120.24 and the minimum and maximum value of CPI is found to be 102.70 and 133.20, respectively. The standard deviation shows that each firm- specific series is found to be deviated from its mean value, implying that the financial conditions and strategies of the selected sample firms are different.

Statistics	DY	ROE	CR	DE	PE	MCAP	TOBINQ	TAX	YC	CPI
Mean	0.0124	0.0474	2.1659	0.9864	51.141	12.564	1.4210	0.0011	-0.8407	120.24
Maximum	0.3023	1.7430	28.560	57.320	22222.2	15.610	17.460	0.0858	-0.1895	133.20
Minimum	0.0003	-44.070	0.0200	-2.2700	-258.46	7.4752	0.0097	-0.3144	-1.3856	102.70
Std. Deviation	0.0221	1.9019	3.1738	2.8552	935.63	1.3630	2.0653	0.0181	0.4224	10.512
Obs.	564	564	564	564	564	564	564	564	564	564

Source: Emerging Markets Information Service (EMIS) database



Table 3 provides the results of Arellano & Bond (1991) dynamic panel GMM estimation on the determinants of dividend policy. The table result shows that return on equity (ROE) has a negative and significant impact on dividend policy, implying that sample firms pay lower dividend and retain more earnings for their expansion. The coefficient of current ratio (CR) is found to be negative and statistically significant, which indicates that the sample firms strongly felt that cash paid out to investors in the form of dividends may reduce cash on hand, thereby affecting liquidity position of the firms and thus total assets and the net worth. This perception results in paying fewer dividends to the shareholders. The significant positive impact of debt-equity ratio (DE) on dividend policy reflects that sample firms have greater need for external financing and therefore to insure access to external equity capital, the firms motivated to establish a good reputation with shareholders through higher dividend. Besides, the firms use the higher levels of debts in their capital structures to take an advantage of debt tax shield at the expense of creditors. As expected, the risk variable represented by the price-earnings ratio (PE), of the sample firms is found to be negative and statistically significant, implying that the risk of future cash flows to shareholders of sample firms are lower and thus leads to increase in dividend yield. In contrast, the size variable represented by the log of market capitalization (MCAP) is found to be negative and statistically significant because the sample firms under study tend to have greater reinvestment opportunities and pay lesser dividend.

<b>Table 3</b>	
<b>RESULTS OF THE ARELLANO AND BOND (1991)</b>	
<b>DYNAMIC PANEL GMM ESTIMATION</b>	
<b>Dependent variable: Dividend Yield (DY)</b>	
<b>Variables</b>	<b>Coefficients</b>
DY <sub>t-1</sub>	-3.01E-05 (0.0189)
ROE	-0.0007* (0.0001)
CR	-0.0003** (0.0001)
DE	0.0007* (0.0002)
PE	-3.22E-07* (5.92E-08)
MCAP	-0.0020* (0.0007)
TOBINQ	0.0001 (0.0003)
TAX	-0.0699 (0.0523)
YC	0.0019 (0.0018)
CPI	-0.0009* (0.0003)
Hansen J test	3.5588 [0.9291]

A-B test AR(1)	-2.7614*
	[0.0058]
A-B test AR(2)	1.5584
	[0.1191]

**Notes:** ( ) & [ ] - Figures in parentheses are standard errors and probability values, respectively. AR(1) and AR(2) are Arellano–Bond tests for first-order and second-order serial correlation, respectively. Hansen test examines the over-identifying restrictions for the GMM estimators. \* & \*\* indicates one and five percent level, respectively.

The significant inverse relation of inflation (CPI) with dividend yield suggests that the rise in real general prices generates upward pressure on firms' demands for funds, thus raise leverage and restrain dividends. Besides, the high inflationary situation tends to increase the leverage of the firm and thus results in lower dividend yield because of high fixed financial commitments.

In nutshell, the empirical results reveal that the profitability, liquidity, leverage, risk, size and inflation are key determinants of dividend policy of selected NSE listed firms in India. However, the variables such as lagged dividend, investment opportunities, taxation and yield curve are found to be insignificant. Most importantly, the failure to reject the null hypothesis of both the Hansen J test and the serial correlation test support the overall validity of given instrumental variables and no auto correlation in the model, respectively.

## CONCLUSION

The present study empirically attempts to examine the determinants of dividend policy of NSE listed firms in India during the period from 2012/2013 to 2017/2018. We have used the dynamic panel data model for the sample of 95 NSE listed firms with continuous dividend payments from 2012/2013 to 2017/2018. The empirical results suggest that profitability, liquidity, leverage, risk, size of the firm and inflation are the major determinants of dividend policy of selected NSE listed firms in India. Key findings lend credence to the fact that the profitability, liquidity, size of the firm and inflation found to have significant negative impact on dividend policy of the selected NSE firms covered by the study. These findings seem contradictory to the expected outcome contained in the existing literature on the Indian context. The risk variable tends to have negative and significant impact, which is line with the existing literature. Besides, the lagged dividend, investment opportunities, taxation and yield curve do not play significant role in determining the dividend policy. This study has implications for both investors and managers. The managers can consider the key determinants of dividend yield while formulating the suitable dividend policy for a firm. Considering the nature of the firms on the basis of payment of dividends the investors can select the firms for healthier investment.

## ACKNOWLEDGEMENT

The authors acknowledge the immense contribution of Dr. Jebamalai Vinanchiarachi, Principal Adviser, Knowledge Management Associates Austria (Present) and Principal Adviser to the Director General United Nations Industrial Development Organization (2006-2009) for his valuable comments and suggestions on the earlier draft of the paper.

## APPENDIX

<b>Appendix 1</b>					
<b>LIST OF NSE LISTED FIRMS CONSIDERED FOR THE STUDY</b>					
S. No.	Name of the NSE Listed Firm	S. No.	Name of the NSE Listed Firm	S. No.	Name of the NSE Listed Firm
1	Indian Oil Corporation Ltd.	33	Bharat Heavy Electricals Ltd.	65	EID Parry India Ltd.
2	Reliance Industries Ltd.	34	Tech Mahindra Ltd.	66	Dr. Reddy's Laboratories Ltd.
3	Tata Motors Ltd.	35	UltraTech Cement Ltd.	67	Apollo Tyres Ltd.
4	Bharat Petroleum Corporation Ltd.	36	Tata Power Company Ltd.	68	CESC Ltd.
5	Hindustan Petroleum Corporation Ltd.	37	Power Finance Corporation Ltd.	69	LIC Housing Finance Ltd.
6	Oil And Natural Gas Corporation Ltd.	38	Reliance Infrastructure Ltd.	70	TVS Motor Company Ltd.
7	Tata Consultancy Services Ltd.	39	Power Grid Corporation of India Ltd.	71	Tata Chemicals Ltd.
8	Tata Steel Ltd.	40	ICICI Bank Ltd.	72	ACC Ltd.
9	Larsen & Toubro Ltd.	41	United Spirits Ltd.	73	Suzlon Energy Ltd.
10	Bharti Airtel Ltd.	42	Rural Electrification Corporation Ltd.	74	Exide Industries Ltd.
11	Coal India Ltd.	43	Bajaj Finserv Ltd.	75	Shree Renuka Sugars Ltd.
12	Mahindra & Mahindra Ltd.	44	Ashok Leyland Ltd.	76	Bank of India
13	NTPC Ltd.	45	Jet Airways India Ltd.	77	Bosch Ltd.
14	State Bank of India	46	Ambuja Cements Ltd.	78	Siemens Ltd.
15	Vedanta Ltd.	47	Reliance Communications Ltd.	79	Oil India Ltd.
16	Infosys Ltd.	48	InterGlobe Aviation Ltd.	80	Shriram Transport Finance Company Ltd.
17	Corporation Ltd.	49	Ruchi Soya Industries Ltd.	81	Kotak Mahindra Bank Ltd.
18	JSW Steel Ltd.	50	Hindustan Zinc Ltd.	82	Cairn India Ltd.
19	ITC Ltd.	51	Axis Bank Ltd.	83	IDFC Ltd.
20	Wipro Ltd.	52	Tata Communications Ltd.	84	United Breweries Ltd.
21	GAIL India Ltd.	53	Reliance Capital Ltd.	85	Coromandel International Ltd.
22	Steel Authority of India SAIL Ltd.	54	Lupin Ltd.	86	GMR Infrastructure Ltd.
23	HCL Technologies Ltd.	55	Asian Paints Ltd.	87	NHPC Ltd.
24	Motherson Sumi Systems Ltd.	56	UPL Ltd.	88	Bajaj Finance Ltd.
25	Grasim Industries Ltd.	57	Punjab National Bank	89	Shree Cements Ltd.
26	Redington India Ltd.	58	MRF Ltd.	90	Jindal Stainless Ltd.
27	Chennai Petroleum Corporation Ltd.	59	Max Financial Services Ltd.	91	Hindustan Construction Company Ltd.
28	Adani Enterprises Ltd.	60	Aurobindo Pharma Ltd.	92	Canara Bank
29	Hindustan Unilever Ltd.	61	Aditya Birla Nuvo Ltd. Amalgamated	93	Bombay Burmah Trading Corporation Ltd.
30	Idea Cellular Ltd.	62	Sundaram Clayton Ltd.	94	Cadila Healthcare Ltd.
31	HDFC Bank Ltd.	63	Bank of Baroda	95	NMDC Ltd.
32	Sun Pharmaceutical Industries Ltd.	64	Cipla Ltd.		

## REFERENCES

- Ahmed, H. & Javid, A.Y. (2009). The determinants of dividend policy in Pakistan. *International Research Journal of Finance and Economics*, 29, 110-125.
- Aivazian, V. & Booth, L. (2003). Do emerging market firms follow different dividend policies from US firms? *Journal of Financial Research*, 26(3), 371-387.
- Akerlof, G. (1970). The market for lemons: Qualitative uncertainty and the market mechanism. *Quarterly Journal of Economics*, 84, 488-500.
- Amidu, M. & Abor, J. (2006). Determinants of dividend pay-out ratios in Ghana. *The Journal of Risk Finance*, 7, 136-145.
- Arellano, M. & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58, 277-297.
- Azhagaiah, R. & Gejalakshmi, S. (2014). Determinants of dividend policy: Evidence from IT sector in India. *Pacific Business Review International*, 6(11), 34-38.
- Baker, H.K. & Powell, G.E. (1999). How corporate managers view dividend policy. *Quarterly Journal of Business and Economics*, 38, 17-35.
- Berk, J. & Demarzo, P. (2014). *Corporate Finance, Global Edition (Third Edition)*. Pearson publications.
- Bhattacharya, S. (1979). Imperfect information, dividend policy and 'the bird in the hand' fallacy. *The Bell Journal of Economics*, 10(1), 259-270.
- Black, F. (1976). The dividend puzzle. *The Journal of Portfolio Management*, 2(2), 5-8.
- Black, F. & Scholes, M.S. (1974). The effects of dividend yield and dividend policy on common stock prices and returns. *Journal of Financial Economics*, 1, 1-22.
- Campbell, J. & Beranek, W. (1955). Stock price behaviour on ex-dividend dates. *Journal of Finance*, 10, 425-429.
- Das, S. (2017). Firm characteristics and dividend policy in India. *Transnational Corporations Review*, 9(3), 190-200.
- DeAngelo, H., DeAngelo, L. & Stulz, R.M. (2006). Dividend policy and the earned/contributed capital mix: A test of the life-cycle theory. *Journal of Financial Economics*, 81(2), 227-254.
- DeAngelo, H., DeAngelo, L. & Skinner, D. (1992). Dividends and losses. *Journal of Finance*, 47, 1837-1863.
- Devaki, S. & Kamalaveni, D. (2012). Shareholding patterns and dividend pay-out: An empirical analysis in Indian corporate hotels. *International Journal of Multidisciplinary Research*, 2(1), 49-63.
- Devanadhen, K. & Karthik, P. (2015). Determinants of dividend policy of public and private commercial banks in India: A panel data approach. *Journal of Arts, Science and Commerce*, 4(3), 111-121.
- Durand, D. & May, A.M. (1960). The ex-dividend behaviour of American Telephone and Telegraph stocks. *Journal of Finance*, 15, 19-31.
- Easterbrook, F.H. (1984). Two agency-cost explanations on dividends. *American Economic Review*, 74, 220-230.
- Elton, E. & Gruber, M. (1970). Marginal stockholders, tax rates and the clientele effect. *Review of Economics and Statistics*, 52, 68-74.
- Fama, E.F. & French, K.R. (1998). Taxes, financing decisions and firm value. *The Journal of Finance*, 53(3), 819-843.
- Fama, E.F. & French, K.R. (2001). Disappearing dividends: Changing firm characteristics or lower propensity to pay? *Journal of Financial Economics*, 60(1), 3-43.
- Franklin, J. & Muthusamy, K. (2010). Leverage, growth and profitability as determinants of dividend pay-out ratio-evidence from Indian paper industry. *Asian Journal of Business Management Studies*, 1(1), 26-30.
- Fraser, L. & Ormiston, A. (2016). *Understanding Financial Statements (Eighth edition)*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Friend, I. & Puckett, M. (1964). Dividends and Stock Prices. *The American Economic Review*, 54(5), 656-681.
- Ho, H. (2003). Dividend policies in Australia and Japan. *International Advances in Economic Research*, 9(2), 91-100.
- Jensen, M., Solberg, D. & Zorn, T. (1992). Simultaneous determination of insider ownership, debt and dividend policies. *Journal of Financial and Quantitative Analysis*, 27(2), 247-263.
- John, K. & Lang, L. (1991). Insider trading around dividend announcements: Theory and evidence. *Journal of Finance*, 46, 1361-1389.
- Kania, S.L. & Bacon, F.W. (2005). What factors motivate the corporate dividend decision? *American Society of Business and Behavioural Sciences E-Journal*, 1(1), 95-107.
- Kanwal, A. & Kapoor, S. (2008). Relevance of signalling and smoothing approaches to dividend: A study of Indian IT sector. *Asia Pacific Business Review*, 4(4), 104-123.

- Kapoor, S., Anil, M. & Kanwal, A. (2010). Dividend policy determinants of Indian services sector: A factorial analysis. *Paradigm, 1*, 24-39.
- Kashyap, A., Stein, J. & Wilcox, D. (1993). Monetary policy and credit conditions: Evidence from the composition of external finance. *American Economic Review, 83*, 78-98.
- King, M.A. (1977). *Public Policy and the Corporation*. London: Chapman and Hall.
- Knyazeva, A. & Knyazeva, D. (2012). Product market competition and shareholder rights: International evidence. *European Financial Management, 18*, 663-694.
- Kumar, J. (2003). *Ownership structure and dividend pay-out policy in India*. IGIDR Working Paper, Indira Gandhi Institute of Development Research, Mumbai.
- Kumar, J. (2006). Corporate governance and dividends pay-out in India. *Journal of Emerging Market Finance, 5*(1), 15-58.
- Labhane, N.B. & Mahakud, J. (2016). Determinants of dividend policy of Indian companies: A panel data analysis, *Paradigm, 20*(1), 36-55.
- Lintner, J. (1956). Distribution of incomes of corporations among dividends, retained earnings and taxes. *The American Economic Review, 46*(2), 97-113.
- Litzenberger, R. & Ramaswamy, K. (1980). Dividends, short selling restrictions, tax-induced investor clienteles and market equilibrium. *Journal of Finance, 35*(2), 469-485.
- Mahakud, J. (2005). Shareholding patterns and dividend policy: Evidence from Indian corporate sector. *The ICAI Journal of Applied Finance, 11*(9), 40-54.
- 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.
- Miller, M.H. & Modigliani, F. (1961). Dividend policy, growth and the valuation of shares. *The Journal of Business, 34*(4), 411-433.
- Miller, M.H. & Scholes, M.S. (1982). Dividend and taxes: Some empirical evidence. *Journal of Political Economy, 90*, 1118-1141.
- Nissim, D. & Ziv, A. (2001). Dividend changes and future profitability. *Journal of Finance, 56*(6), 2111-2133.
- Oliner, S.D. & Rudebusch, G.D. (1996). A comment on monetary policy and credit conditions: Evidence from the composition of external finance. *American Economic Review, 86*, 300-309.
- Pandey, I.M. & Bhat R. (2004). *Dividend behaviour of Indian companies under monetary policy restrictions*. IIMA Working Paper, Indian Institute of Management, Ahmedabad.
- Ramli, N.M. (2010). Ownership structure and dividend policy: Evidence from Malaysian companies. *International Review of Business Research Papers, 16*(1), 170-180.
- Rozeff, M.S. (1982). Growth, beta and agency costs as determinants of dividend pay-out ratios. *The Journal of Financial Research, 5*(3), 249-259.
- Tobin, J. (1969). A general equilibrium approach to monetary theory. *Journal of Money, Credit and Banking, 1*(1), 15-29.
- Velmurugan. (2015). Determinants of dividend in Indian fertilizer industry. *Journal of Progressive Research in Social Sciences, 1*(1), 1-4.
- Yoon, P.S. & Starks, L.T. (1995). Signalling, investment opportunities and dividend, announcements. *Review of Financial Studies, 8*, 995-1018.