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Determinants of dividends among Indian firms—An empirical study

B. Rajesh Kumar^{1*} and K.S. Sujit²

Abstract: The study aims to understand the determinants of dividend trends of Indian firms. The study was based on a sample of 31,234 firms representing 15 different industry sectors. Construction materials, machinery and transportation equipment sectors were the most dividend intensive sectors in India. Partial least square structural equation modeling methodology (PLS SEM) was employed to examine the determinants of the dividend intensity of Indian firms. Different schemes of path models were tested and the results show that the higher the financial leverage, the lower is the propensity to pay dividends. Firms with high intangibles are expected to have higher agency costs. High growth firms have low dividend payout policies. Dividend intensity of firms is directly related to the size of firm. Higher the R&D intensity of the firms, greater is the dividend intensity of the firms. Firms with higher agency costs tend to have higher dividend intensity. Higher agency costs lead to lower cash flows for Indian firms. Firms with higher liquidity tend to pay more dividends. Profitable firms tend to have higher dividend intensity.

Subjects: Finance; Corporate Finance; Business, Management and Accounting

Keywords: dividends; PLS SEM; financial leverage; intangibility; agency cost

1. Introduction

Investment, financing, and dividend decisions are the three major decisions undertaken by managers in a firm. Dividends are distributions of a portion of a firm's earnings to its shareholders. The

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PUBLIC INTEREST STATEMENT

This research paper aims to understand the determinants of dividend pay-out among Indian firms. The study analyzes the dividend trends of 31,234 firms representing 15 different industrial sectors. Construction materials, machinery, and transportation equipment sectors were the most dividend intensive sectors in India. Firms with high debt in their capital structure tends to pay less dividends. Firms with high intangibles tend to have higher agency costs. Growing firms tend to pay less dividends to shareholders. Large firms tend to pay more dividends to its shareholders. Firms with high investments in Research and Development have high dividend intensity. Firms with high agency costs pay more dividends to shareholders. This could be a strategy of firms to reduce agency conflicts between shareholders and managers. Firms which are liquid and profitable tend to pay more dividends to shareholders.

fundamentals of the company determine the ability and willingness of companies to pay dividends. The investment principle states that firms should invest only in projects, which earn a return greater than the minimum acceptable hurdle rate. The dividend principle suggest that firms ought to return cash generated to the shareholders in the form of dividends in a scenario where there are no enough investments to earn a minimum required return. Typically, mature companies pay dividends. Dividends and stock buyback returns are influenced by stock characteristics. Dividends have made up the major chunk of an investor's total return. A study based on a period of 100 years suggest that approximately three quarters of the real return from stock market came from dividends and only one quarter came from capital gains (Forbes Report 2011).¹ Dividends provide investors with consistent realized income on a regular basis. Capital gains are not materialized until the shares are not actually sold. Capital gains disappear when stock prices drop in value. Dividends assist investors to assess a company as an investment prospect. During the high growth period, Microsoft paid no dividends and plowed back all its earnings to fuel further growth. When growth slowed down, Microsoft initiated dividend payment and buyback schemes. Usually high growth firms retain earnings and don't pay dividends. Apple started paying dividends only in the year 2012.

There are three schools of thoughts on dividend policy. The dividend irrelevance theory suggests that dividends do not affect the firm value (Miller & Modigliani, 1961). The assumption made for dividend irrelevance theory is that dividends are not a tax disadvantage for investors and firms can raise funds in capital markets for new investments without much issuance costs. According to the proponents of the second school of thought, dividends are bad since they have a tax disadvantage for average shareholder and the value of firm decreases when dividends are paid on account of this tax disadvantage (Brennan, 1970). Dividends create tax disadvantage for investors when dividend gains are taxed much more than capital gains. Dividend payments reduce the returns to stockholders after personal taxes. The viewpoint of the third school of thought is that dividends are good and can increase the value of the firm (Gordon, 1963; Lintner, 1962; Walter, 1963). The assumption is that investors prefer dividends to capital gains since dividends are certain and capital gains are not. Investors who are risk averse prefer dividends. The clientele effect suggests that stockholders tend to invest in firms whose dividend policies match their preferences (Bernardo & Welch, 2000; Miller & Modigliani, 1961; Pettit, 1977). This clustering of stocks in companies with dividend policies that match their preferences is called the client effect. Dividend payment acts as an information signal to financial markets (Bhattacharya, 1979; Gillet, Lapointe, & Raimbourg, 2008; John & Williams, 1985; Miller & Rock, 1985). Dividend announcements are usually viewed positively by financial markets.

2. Theoretical postulates

The residual theory of dividends postulates negative relationship between dividend payout and external financing costs (Alli, Khan, & Ramirez, 1993). The investment policy of a company is expected to determine the dividend decisions of firms (Fama, 1974; Green, Pogue, & Watson, 1993). Firms with high revenue growth focus on higher investment for further growth prospects (Deangelo, Deangelo, & Stulz, 2006). On account of costly external financing, firms tend to have lower dividend payout. In a scenario of higher future growth rate of revenues, firms are likely to retain funds for future capital expenditures and thereby lowers the dividend payout ratio (Myers & Majluf, 1984). The residual theory suggests that firms will pay dividends only when there are residual cash flows after meeting all its investment obligations (Fama, 1974; Higgins, 1972). Growth firms are characterized by low payout ratios. Higher the risk of the firm, lower the dividend payout (Rozeff, 1982). Riskier firms have higher operating and financial leverage. Firms with fixed payment obligations like interest charges will have lower dividend payouts to avoid the cost of external financing (Rozeff, 1982). In other words, internal financing through retained earnings are preferred than external financing. Firms use debt more frequently than equity while raising external capital (Henderson, Narasimhan, & Weisbach Michael, 2006). Dividend payout is a means to reduce the agency costs (Easterbrook, 1984; Rozeff, 1982). The signaling theory suggests that dividends convey information about the current level of earnings (Aharony & Swary, 1980; Asquith & Mullins, 1983; Lintner, 1956). The higher the cash flow of the firms, the higher would be the dividend payout. Firms tend to increase their financial slack in

order to maintain their ability to undertake profitable investments. In this context, firms reduce dividend payments. Profitable firms tend to have higher dividend payouts (David & Osobov, 2008).

3. Review of literature

Lintner (1956) suggests that firms have target payout ratios and adjust dividends to earnings with a lag. Miller and Modigliani (1961) proves the irrelevance of dividend policy in a perfect capital market. Higgins (1972) develops a model, which uses the firms' cash flow constraint and its optimal debt equity ratio to derive an expression, which relates dividends to profits and investments. The model developed by Higgins points that the optimal payout is a function of residual dividend policy combined with the minimization of the sum of the costs of "excessive current assets" and the costs of external equity financing. Dividend payout is influenced by factors like fund requirement for investment purposes and debt financing obligations. Fama (1974) finds that investment intensity influences dividend policy. McCabe (1979) finds that new long-term debt has a negative relationship with dividend payout intensity. Myers and Majluf (1984) finds that growth firms are characterized by low payout ratios. Aharony and Swary (1980) show that managers use cash dividend announcements to signal changes in their expectations about future prospects of the firm. Rozeff (1982) suggests that firms with higher operating and financial leverage will have a lower dividend payout policy for the purpose of minimizing the cost of external financing. Positive relationship is expected between size and dividend payout because of the fact that large firms face lower issuing costs (Rozeff, 1982). Alli et al. (1993) find support for the role of dividends in mitigating agency problems. The study also suggests that firms with financial flexibility, which maintain stable dividends, pay higher dividends. Kale and Noel (1990) suggest that dividend payment signals the quality of the firm's cash flows. Dividends convey information about the current or future level of earnings (Bhattacharya, 1979; John & Williams, 1985; Kane, Young, & Marcus, 1984). Titman and Wessels (1988) find that firms having more tangibility in terms of collateralized assets tend to have lesser agency cost problems between bondholders and stockholders as these assets serve as collateral against borrowing. Positive relationship is expected between tangibility and dividend payout. Liquidity and dividend payment are positively related (Benito & Young, 2003). Fama and French (2001) find that size, profitability and investment opportunity are fundamental factors which affect dividend payments. The propensity to pay dividends is higher among more profitable firms (David & Osobov, 2008). The study by Kuo, Philip, and Zhang (2013) suggests that risk and liquidity are important determinants of the dividend policy in developed markets of US and Europe. The study by Louis and Urcan (2015) find that the effect of conservatism on dividend payout is more negative when agency conflicts between managers and shareholders are potentially more pronounced. Firms with high-retained earnings in relative to total equity or total assets are more likely to pay dividends (Coulton & Ruddock, 2011). The propensity to pay depends on profitability, investment opportunities, leverage, and cash flow (Abdulkadir, Abdullah, & Wong, 2016). Sah and Zhou (2012) find that REITs with higher leverage ratio and larger asset bases are more likely to issue stock dividend. In the developed nations of US, UK, Germany, France, and Japan, the propensity to pay dividends is higher among larger, profitable firms with a high proportion of retained earnings (David & Osobov, 2008). Positive relationship is established between dividend payout and profitability, asset tangibility among Jordanian firms (Basil, 2011).

Profitable, mature, and liquid Indian firms have higher dividend payout ratio (Labhane & Mahakud, 2016). Dividend payout among Indian firms have been on decline due to the dividend payout policies of smaller, less profitable, and younger firms (Labhane, 2017). Factor analysis results suggest that leverage, liquidity, profitability, growth and ownership structure are the major determinants of dividend payout policy of Indian firms (Gupta & Charu, 2010).

In a general sense, corporate finance theories states that a firm's dividend policy is determined by its need for capital investment, profitability of its assets and size. Studies have focused on influence of cash flows or earnings on the dividend payment of a firm. The empirical studies on the determinants of dividend policy basically focuses on the various theoretical explanations stated in varied competing theories. Empirical research has tested theories like tax clientele theory, signaling theory

and agency theory to explain the dividend payment trends. This research paper attempts to examine these determinants of dividend policies in emerging markets like India.

3.1. Motivation of the present study

Empirical research on determinants of dividend policies provided varied results across countries and time period. These studies have examined the determinants of the dividend policies in the context of specific theories of dividend payout intensity. This study attempts to examine the determinants of dividend payout in an integrated theoretical framework using latent constructs. The integrated theoretical framework is tested using the methodology of Partial least square structural equation model.

4. Objective of the study

The dividend policies of developed markets have been widely researched and debated. During the last two decades, many emerging markets have grown in size, quality and transparency, which have attracted investments from investors and international fund managers. The dividend policies of emerging markets have not been analyzed as extensively like that of developed markets. The information asymmetry argument and agency cost are often cited as the explanations for the existence of dividends in Western research. The information asymmetry argument suggest that managers use dividends to signal capital markets about future profitability (Miller & Modigliani, 1961). These hypotheses assume that ownership and control are separate and that access to capital markets for funding investment projects is easily available. The financial system of emerging markets is characterized by closely held corporations and concentrated ownership (Glen, Karmokolias, Miller, & Shah, 1995). Hence, the presence of concentrated ownership structure reduces the need to use dividends as an information signaling mechanism as key information would be disseminated to large shareholders in emerging markets. Governments in emerging markets considerably influence the dividend policies through fiscal and monetary policies (Glen et al., 1995). In the context of institutional differences between emerging and developed markets, it is important to examine the determinants of dividend policy in an emerging market like India.

The Indian financial system was transformed from a public sector dominated structure to free market system because of significance reforms in the year 1991. A shift in the financing behavior has been observed, as Indian companies moved from state-owned banks to market-based equity capital markets for funding sources. The last two decades have witnessed significant improvements in Indian stock market in terms of trading, clearing, and settlement, which might have an influence on corporate dividend behavior. Institutional improvements like the flexibility for corporations to issue shares through book building rather than mandatory fixed price offerings have led to efficient price forming mechanism. These initiatives might facilitate Indian firms to seek funds in capital markets rather than internal financing by means of reduced dividend payouts and retained earnings. During the period of liberalization, the average dividend payout has increased for companies that are continuously paying dividends. The new economic policy since 1991 have led to the listing of many new firms in the stock exchanges. The liberalization era has led to changed shareholding pattern of firms because of availability of many alternative sources of finance in the capital market. In India, a firm that has declared, distributed or paid any amount, as dividend is required to pay dividend distribution tax of 15 percent. In the context of the changed economic scenario, this study aims to understand the determinants of dividend payout of Indian firms.

The study focuses on the examination of factors that determine the dividend policy of the firm. The study analyzes the impact of size, growth of earnings and cash flows, capital investment intensity, liquidity on the dividend intensity of firms. The impact of intangibility and discretionary expenditures on the dividend paying capacity of firms is also examined in this paper. The study examines the impact of investment decisions on dividend trends of Indian companies.

Table 1. Dividend intensity characteristics of Indian firms

Sl. no	Industry	No of firms	Mean		Standard deviation	
			Equity dividend as % of PAT	Dividend/ Sales	Equity dividend as % of PAT	Dividend/ sales
1	Construction materials	556	9.36	0.013	80.4	0.3
2	Machinery	1,405	8.47	0.005	57.3	0.1
3	Transport equipment	817	8.18	0.002	19.4	0
4	Diversified	380	7.41	0.008	37.7	0.1
5	Chemicals	2,340	6.02	0.003	17.8	0.1
6	Consumer goods	764	5.29	0.002	20.1	0
7	Mining	194	4.76	0.005	17.7	0.1
8	Financial services	5,365	4.21	0.002	28.1	8.3
9	Non-financial services	9,074	4.07	0.02	34.8	0.8
10	Food	2,114	3.61	0.006	16.5	69.8
11	Textiles	1,668	3.33	0.007	14.7	0.2
12	Electricity	728	3.29	0.009	18.6	0.2
13	Construction & real estate	2,490	3.13	0.007	34.9	0.1
14	Metal products	1,790	2.63	0.008	10.7	0.2
15	Miscellaneous manufacturing	1,549	1.27	0.001	10.2	0

Notes: The dividend payment trends of 31,234 firms representing 15 different industry sectors is given in the table. The dividend intensity is examined through variables like equity dividend as percentage of profit after tax and the ratio of dividend to sales. The mean and standard deviation of the variables are given in the last four columns.

4. Data and methodology

The study was based on a sample of 31,234 firms representing 15 different industry sectors. The data were taken for the latest financial year available. The sample period was 2015–2016. The descriptive statistics for the dividend intensity variables is given in the following Table 1.

The dividend characteristics of 31,234 firms were examined in the study. The dividend variables used to represent dividend intensity are equity dividend as percent of profit after tax (PAT) and the ratio of dividend to sales. On the basis of average values of equity dividend as percent of profit, construction materials, machinery and transportation equipment sectors were the most dividend intensive sectors in India. On average value basis, the construction sector paid approximately 9 percent of profit after tax as dividends. Machinery and transport equipment sectors paid about 8 percent of its net profit as dividends on average basis. In terms of average dividend to sales measure, the most dividend intensive sectors were construction materials, electricity, diversified, metal products, and textiles industry sectors. On average basis, approximately one percent of sales was distributed as dividends among the construction material and electricity sector.

Partial least square structural equation modeling methodology (PLS-SEM) was employed to examine the determinants of the dividend intensity of Indian firms. The source of data was CMIE Prowess database. The financial data collected were for the latest financial year. The PLS-SEM methodology was adopted based on the assumption that the determinant variables are often latent which cannot be observed directly. The structural equation modeling (SEM) encompasses all the reflective indicators in one construct. Covariance-based structural equation modeling (CB-SEM) and partial least

squares structural equations modeling (PLS-SEM) are the two types of SEM models used in research. On account of theoretical and methodological issues, there had been an increase in use of PLS-SEM compared to that of CB-SEM (Hair, Sarstedt, Pieper, Ringle, & Mena, 2012). Variance which predicts construct relationship is explained effectively by PLS-SEM and this method emphasizes on maximizing the explained variance of the endogenous latent variables instead of replicating the theoretical covariance matrix. PLS-SEM methodology becomes very useful to conduct predictive analysis with highly complex data. This methodology estimates latent variables through composites, which are exact linear combinations of the indicators assigned to the latent variables. We use WrapPLS software to apply PLS-SEM as this technique effectively handles nonlinear relationships.

4.1. Variable selection

The list of latent constructs, variables and its definition are given in Appendix 1. The determinant variables (independent variables) are latent which cannot be observed directly. Latent constructs are made up of a number of variables as single proxy variable will not be able to assess the real impact of the construct on the dependent variable of dividend payout. For example, the leverage construct is composed of variables like debt equity ratio (DER), total debt to capital (TDC), total debt to total assets (TDTA) and long term debt to total assets (LTDTA). The construct intangibility is proxied by variables like Intangible assets to total assets (Intang), Price to Earnings (PE) and Price to Book (PB). The tax construct component consists of tax scaled by sales and assets. The ratios included in the tax construct are corporate tax provisions to profit before depreciation, interest and taxes (TAXPBDI) and corporate tax provisions to sales (TAXSA) and Corporate Tax Provision to PBT (TAXPBT).

A significant negative relationship between financial leverage measures like debt to capital ratio and dividend payout ratio (Fama, 1974; Higgins, 1972). Investment opportunities or intangibility is proxied by variables like price to book and price to earnings ratio (Myers & Majluf, 1984). We use other additional measures like intangible assets to total assets in the latent construct Intangibility (See Appendix 1). Cash flow variables are proxied by variables like net operating cash flow to total assets (Easterbrook, 1984; Jensen & Meckling, 1976; Rozeff, 1982), Size is proxied by log assets and log sales (Fama & French, 2001; Rozeff, 1982). Profitability ratios like return on total assets and return on capital employed assets were included in the profit construct (David & Osobov, 2008; Fama & French, 2001). Growth construct are represented by variables like growth rate in revenues, operating income (Myers & Majluf, 1984; Rozeff, 1982). Tax variables were proxied by some studies (Brennan, 1970; DeAngelo & Masulis, 1980). Liquidity is proxied by current ratio (Labhane & Mahakud, 2016) along with other measures of liquidity. Tangibility measures include ratios like fixed assets divided by total assets (Titman & Wessels, 1988). All the constructs used in this study have new variables for examination. We have used an array of new proxy variables to form the constructs for understanding the determinants of the payout policies.

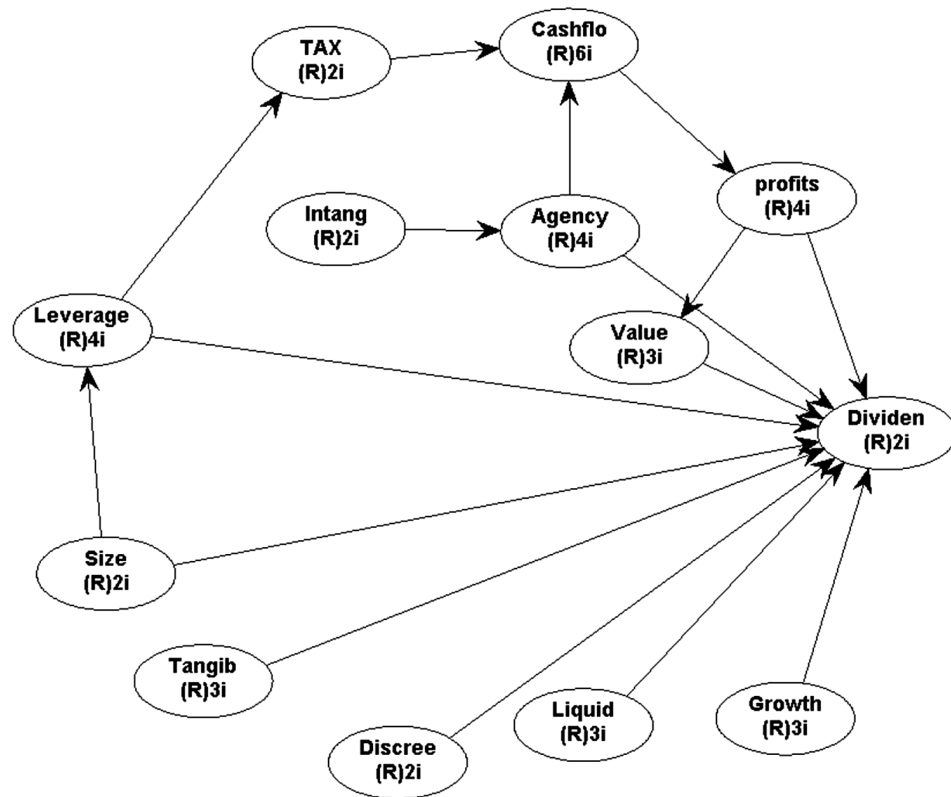
The PLS-SEM methodology was adopted based on the assumption that the determinant variables are often latent which cannot be observed directly. A single target proxy variable may fail to capture the real effect of the construct on the dependent variable.

Figure 1 shows the relationship between different constructs which are reflective in nature. Size, tangibility in terms of capital investments, discretionary expenditure intensity and liquidity constructs are directly related to the latent construct of dividends. The path diagram of leverage is related to dividends directly and through construct variables of tax, cash flow and growth. The constructs of intangibility and agency costs are also related to the construct dividend. In one construct, the maximum number of variables initially included was seven. Scale purification is done to get the final revised model with acceptable reliability and validity.

5. PLS-SEM results

As a first step in PLS-SEM, missing data imputation is carried out by Stochastic Multiple Regression Imputation algorithm. The latent constructs consist of reflective measurement scale which are interchangeable and must be highly correlated. In the initial assessment of the model, the loadings of

Figure 1. PLS-SEM initial model.



all the variable indicators in the constructs is used for scale purification. Any indicator which has less than 0.5 loading is dropped from the model. This means that the indicator is different from the rest and must be dropped. A total of nine indicator variables representing different latent constructs have been dropped. The list of dropped indicators from the initial model are highlighted in red in Appendix 1.

This exercise of scale purification is essential as the indicators representing latent variable construct must be highly correlated. In other words, these dropped variables are not interchangeable and do not fit to be indicators representing that latent variables. Due to this exercise the sample size has not changed but the number of indicators representing that latent variable has reduced.

After scale purification, the model is re-estimated for reliability and validity of the construct as the measurement model employs the reflective measurement scale. Hence, measurement model must be assessed for its reliability and validity in order to achieve consistency (Hair, Sarstedt, Pieper, Ringle, Mena, 2012; Petter, Straub, & Rai, 2007). The initial testing of the reliability and validity of latent variables indicated that latent constructs like Tangibility (TANG) and Value didn't qualify the criteria and hence dropped from the model. Rest of the values for all the constructs are either meeting all the qualifying criteria or at least two of them and hence retained in the model.

6. Reliability assessment

There are two measures to validate the internal consistency reliability of reflective measures i.e. composite reliability and Cronbach's alpha. Composite reliability is applied as an estimate of the internal consistency and of the construct (Hair, Sarstedt, Ringle, & Mena, 2012). The satisfactory range for composite reliability values are 0.60 to 0.70 in exploratory research and 0.70 to 0.90 in more advanced stages of research (Nunnally & Bernstein, 1994). As shown in Table 2, the composite reliability score of all the latent construct are in the range 0.66 to 0.95 indicating that latent variables

Table 2. Reliability and validity of the latent construct

Latent constructs	Composite reliability coefficients	Cronbach's alpha coefficients	Average variances extracted	Full collinearity VIFs
Leverage (Leverage)	0.797	0.658	0.500	1.09
Intang (Intangibility)	0.947	0.888	0.900	1.036
Dividend (Dividend)	0.663	-0.018	0.500	1.633
Cashflow (Cash flow)	0.865	0.808	0.522	2.488
Growth (Growth)	0.869	0.768	0.692	1.154
Size (Size)	0.921	0.828	0.854	1.307
TAX (TAX)	0.763	0.38	0.617	1.611
Discreet (Discretionary expenses)	0.926	0.839	0.861	4.176
Agency (Agency cost)	0.93	0.899	0.770	3.283
Liquid (Liquidity)	0.953	0.925	0.870	1.06
Profits (Profitability)	0.925	0.891	0.757	2.076

Notes: Two latent constructs were removed after initial testing as these constructs didn't qualify the criteria for reliability and validity of latent variables. Composite reliability and Cronbach's alpha are measures used to validate internal consistency reliability of reflective measures. Construct Validity is tested using average variance extracted (AVE).

are reliable. Two latent variables i.e. Value and Tangibility were dropped due to poor reliability and validity.

Reliability of measurement model in measuring intended latent constructs is checked using Cronbach alpha score. Nunnally (1978) suggests that Cronbach alpha greater than 0.7 indicates that the measurement model is reliable. As seen in the above Table 2, there are three latent construct variables where Cronbach alpha value is less than 0.7. Since these constructs qualify composite reliability test along with the criteria of average variance extracted (AVE) values are equal or greater than 0.5, these latent variables are retained in the model.

7. Construct validity

The estimated strength of these relationships in the model between the latent variables can only be meaningfully interpreted if construct validity is established (Peter & Churchill, 1986). In order to test construct validity, the convergent and discriminant validity is used. Convergent validity is measured using the average variance extracted (AVE) which is the grand mean value of the squared loadings of all indicators associated with the construct. Each construct should account for at least 50 percent of the assigned indicators' variance. As can be seen from the Table 1 all latent constructs have AVE values above or equal to the threshold limit of 0.5.

8. Discriminant validity

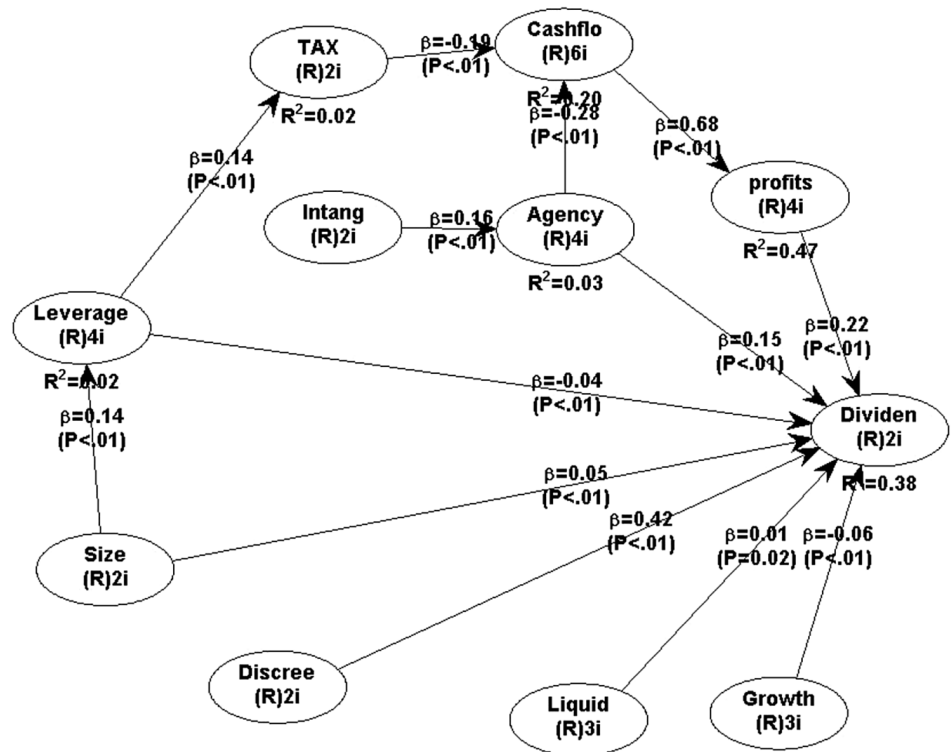
Discriminant validity ensures that a construct measure is empirically unique and represents phenomena of interest that other measures in a structural equation model do not capture (Hair, Sarstedt, Ringle, et al., 2012). Discriminant Validity is established if a latent variable accounts for more variance in its associated indicator variables than it shares with other constructs in the same model (Fornell & Larcker, 1981). The Fornell-Larcker criterion suggests that the square root of AVE must be greater than the correlation of the construct with all other constructs in the structural model. Table 3 shows the correlations among latent variables with square root of average variance extracted (AVE) by each latent variable. It can be seen that each latent variable AVEs is higher than the correlation of the latent variables indicating discriminant validity of the latent variables.

Table 3. Correlation among latent variables with square root of AVEs

	Leverage	Intang	Dividend	Cashflow	Growth	Size	TAX	Discre	Agency	Liquid	Profits
Leverage	0.705										
Intang	0.022	0.948									
Dividend	-0.069	0.076	0.704								
Cashflow	-0.12	-0.033	-0.015	0.723							
Growth	-0.019	0.082	-0.007	-0.163	0.832						
Size	0.125	-0.05	0.013	0.325	-0.33	0.924					
TAX	0.019	0.116	0.438	-0.216	0.034	-0.064	0.786				
Discre	0.034	0.147	0.556	-0.375	0.131	-0.167	0.596	0.928			
Agency	0.002	0.156	0.472	-0.355	0.121	-0.233	0.521	0.825	0.877		
Liquid	-0.158	0.06	0.117	0.014	0.064	-0.107	0.098	0.127	0.116	0.933	
Profits	-0.168	0.016	0.183	0.67	-0.024	0.185	0.008	-0.05	-0.096	0.081	0.87

Note: Square roots of average variances extracted (AVEs) shown on diagonal.

Figure 2. Result of nonlinear bootstrapping path coefficients.



Another popular approach for establishing discriminant validity at the item level is by the assessment of cross loadings. Discriminant validity is established if each measurement item correlates weakly with all other constructs except for the one to which it is theoretically associated. The result of cross loading is presented in Appendix 2. It can be seen that each measurement items correlates weakly with all other constructs hence, establishing discriminant validity. After the establishment of the reliability and validity of the indicators and latent constructs, the path coefficients and assessment of the model fit and quality indices is carried out.

9. Results of the measurement model (outer model) of PLS-SEM

Path coefficient of the measurement model is estimated using various schemes to ensure robustness of the relationship. Stable method relies directly on the application of exponential smoothing formulas and yield estimates of the actual standard errors that are consistent with those obtained via bootstrapping (Kock, 2014). In many cases this method yielded more precise estimates of the actual standard errors. Both linear and nonlinear models are tested using PLS regression and robust path analysis. Nonlinear model gave superior results. However, signs and significance of results were in both the model. The figure of nonlinear model is presented for a pictorial overview of the results (Figure 2).

The results of bootstrapping using both the schemes are presented in Table 4 and 5. Bootstrapping creates number of resamples. In this case 50 replacements were done wherein each resample contains a random arrangement of the rows of the original data-set, where some rows may be repeated.

10. Model-fit and quality indices

Model fit and quality indices of the measurement models of both Linear and Nonlinear is reported in Table 6. Based on the indices, it is clear that nonlinear model is better in terms of goodness of fit and explanatory power. All the indicators are within the acceptance range and significant. Tenenhaus goodness of fit value is 0.364, which indicates that 36% of the variation is explained by the

Table 4. PLS regression using nonlinear bootstrapping

Robust path analysis—nonlinear-bootstrapping						
	Leverage	Dividend	Cashflow	Tax	Agency	Profits
Leverage		-0.042*		0.144*		
Intang					0.159*	
Cashflow						0.682*
Growth		-0.057*				
Size	0.141*	0.051*				
Tax			-0.186*			
Discreet		0.42*				
Agency		0.15*	-0.277*			
Liquid		0.01*				
profits		0.218*				

*Indicates significant at 1% level of significance i.e. $p < 0.001$.

Table 5. PLS regression using linear bootstrapping

Robust path analysis—linear bootstrapping						
	Leverage	Dividend	Cashflow	TAX	Agency	Profits
Leverage		-0.061*		0.019*		
Intang					0.156*	
Cashflow						0.67*
Growth		-0.058*				
Size	0.125*	0.075*				
TAX			-0.042*			
Discreet		0.508*				
Agency		0.092*	-0.333*			
Liquid		0.029*				
Profits		0.19*				

*Indicates significant at 1% level of significance i.e. $p < 0.001$.

Table 6. PLS regression model fit and quality indices for linear and nonlinear model

Model fit and quality indices	Linear	Non-linear	Acceptance
Average path coefficient (APC)	0.182	0.195	$p < 0.001$
Average R-squared (ARS)	0.165	0.186	$p < 0.001$
Average adjusted R-squared (AARS)	0.165	0.186	$p < 0.001$
Average block VIF (AVIF)	1.642	3.529	Acceptable
Average full collinearity VIF (AFVIF)	1.901	1.901	Acceptable
Tenenhaus GoF (GoF)	0.342	0.364	Large for nonlinear model
Sympson's paradox ratio (SPR)	1.00	1.00	Acceptable
R-squared contribution ratio (RSCR)	1.00	1.00	Acceptable
Statistical suppression ratio (SSR)	0.846	1.00	Acceptable
Nonlinear bivariate causality direction ratio (NLBCDR)	0.846	0.846	Acceptable

Notes: Tenenhaus GoF (GoF) value ≥ 0.36 is considered as large goodness of fit. Sympson's paradox ratio (SPR) acceptable if ≥ 0.7 , R-squared contribution ratio (RSCR) ≥ 0.9 is acceptable, Statistical suppression ratio (SSR) should be acceptable if the value is greater than 0.7. Nonlinear bivariate causality direction ratio (NLBCDR) value should be greater than 0.7.

Table 7. R-square and Q-Square

Latent variables	Linear		Non-linear	
	Adj R-square	Q-Square	Adj R-square	Q-Square
Leverag	0.016	0.016	0.02	0.02
Dividend	0.37	0.37	0.381	0.376
Cashflow	0.128	0.127	0.202	0.199
TAX	0	0.002	0.021	0.019
Agency	0.024	0.024	0.025	0.025
Profits	0.449	0.45	0.465	0.464

Note: Adj R-square and Q-square values indicates strength of the least-squares fit and explains the variance in the observed activities for the dependent latent variable.

measurement model and considered to be reliable based on nonlinear model. All the indices fit within the accepted levels and the model having medium goodness of fit as the GoF value is above 0.36.

Model wise dependent latent variable’s R-square and Q-square is reported in Table 7. The nonlinear model has better explanatory power compared to linear model as R-square and Q-square values are higher in nonlinear model. These values indicate that the measurement model could explain around 38 percent variations in dividend, 46 percent of profitability and around 20 percent of cash flow in Indian industries.

11. Discussion of results

Both the linear and nonlinear model give similar predictions. Leverage is negatively related to latent construct dividend. The path coefficient value for impact of leverage on dividends was -0.061 for linear and -0.042 for nonlinear model and both the results are statistically significant at 1% level of significance. This result suggests that highly leveraged firms tend to pay fewer dividends (Al-Malkawi, 2008; Higgins, 1972; McCabe, 1979; Rozeff, 1982). The leverage construct included variables like debt equity ratio, total debt to capital ratio, total debt to total assets and long term debt to total assets. Higher the financial leverage, lower is the propensity to pay dividends. Leverage is positively related to tax construct with statistical significance. The tax construct was represented by variables like corporate tax provisions to sales and cash flow. The path coefficient value of leverage with tax was 0.144 with one percent statistical significance in nonlinear model. Positive relationship exists between tax related variables and leverage due to interest tax benefits (DeAngelo & Masulis, 1980; Miller, 1971; Titman & Wessels, 1988). Higher the leverage, greater is the tax benefits for Indian firms. Adding debt to a firm’s capital structure lowers its tax liability on account of deduction of interest payments and increases its after tax cash flow. Latent construct intangibility is positively related to agency costs (path coefficient value of 0.159 in nonlinear model and 0.156 in linear model with statistical significance at 1% level). Intangibility is represented by variables like price to book and price to earnings ratio. Agency costs are proxied by variables like total sales to total assets, communication expenses to sales etc. Firms with high intangibles are expected to have higher agency costs. Firms with high intangibles are expected to have higher conflicts of interest among different stakeholders. Higher cash flows lead to greater profitability for firms (path coefficient value of 0.682 for nonlinear model and 0.67 for linear model). Negative relationship between growth of cash flows and dividend construct is established in the study (path coefficient value of -0.057 in nonlinear model and -0.058 in linear model). Both the results were statistically significant. High growth firms retain cash flows for future investment activities thus reducing dividend payments to shareholders (Myers & Majluf, 1984). Usually mature companies with less growth opportunities pay higher proportion of dividends in relation to earnings of firms.

Size is positively related to leverage with statistical significance (path coefficient value of 0.141 in nonlinear model; value of 0.125 in linear model). Size is proxied by variables of log of assets and log

of sales. The results suggest that large firms tend to take more debt in the capital structure. Size of the firm is directly related to leverage (Harris & Ravi, 1991; Rajan & Zingales, 1995). The study also documents the positive relationship between size and dividends with statistical significance. (Path coefficient value of 0.051 and 0.075 in non linear and linear model). Large firms tend pay more dividends (Fama & French, 2001; Rozeff, 1982). In other words, dividend intensity of firms is directly related to the size of firm. Construct with tax variables is negatively related to cash flow with statistical significance. The construct representing discretionary expenditure is positively related to dividend construct with statistical significance in both models. The path coefficient value is 0.42 in nonlinear model. Firms with higher discretionary expenditures like R&D have higher dividend payout policies. Higher the R&D Intensity of the firms, greater is the dividend intensity of the firms. R&D expenses signifies investment opportunities. Firms with higher investment opportunities have greater propensity to pay (Abdulkadir et al., 2016). Firms with higher agency costs tend to have higher dividend intensity. The path coefficient value (0.15) is statistically significant in nonlinear model and 0.092 in linear model. It can be interpreted that firms attempt to reduce agency costs by more dividend payments to shareholders. The study establishes negative relationship between agency costs and cash flows (path coefficient value -0.027 in nonlinear model). Higher agency costs lead to lower cash flows for Indian firms. Statistically significant positive relationship is observed between variables of liquidity and dividends and profitability and dividends. In nonlinear model the path coefficient value between liquidity and dividends was 0.01 and the path coefficient between profitability and dividends was 2.18. Liquid firms tend to pay more dividends (Kuo et al., 2013; Labhane & Mahakud, 2016). Profitable firms tend to have higher dividend intensity (Abdulkadir et al., 2016; Basil, 2011; David & Osobov, 2008; Fama & French, 2001).

This study finds that the fundamental factors which influence the decision to pay dividends by Indian companies are leverage, size, growth, investment opportunities, profitability, and liquidity. These findings are consistent with the results of previous researches.

The results also suggest that firms with high intangibles tend to have higher agency costs. Another finding is that firms with higher agency costs tend to pay more dividends to shareholders. Cash flows are lower for firms with high agency costs.

12. Conclusion

The study aims to understand the determinants of dividend payout of Indian firms. The study was based on a sample of approximately 31,234 firms representing 15 different industry sectors. Profit, construction materials, machinery, and transportation equipment sectors were the most dividend intensive sectors in India. Partial least square structural equation modeling methodology (PLS-SEM) was employed to examine the determinants of the dividend intensity of Indian firms. The higher the financial leverage, the lower the propensity to pay dividends. Firms with high intangibles are expected to have higher agency costs. High growth firms retain cash flows for future investment activities thus reducing dividend payments to shareholders. Dividend intensity of firms is directly related to the size of firm. The higher the R&D Intensity of the firms, the greater the dividend intensity of the firms. Firms with higher agency costs tend to have higher dividend intensity. Higher agency costs lead to lower cash flows for Indian firms. Liquid firms tend to pay more dividends. Profitable firms tend to have higher dividend intensity.

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Note

1. <http://www.forbes.com/2011/09/30/the-importance-of-dividends>.

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Appendix 1

List of latent construct, variables and its definitions

Latent variables	Indicators and variable definitions
Leverage	Debt Equity Ratio (DER)
	Total Debt/Capital (TDC)
	Total Debt/Total Assets (TDTA)
	Long term Debt/Total assets (LTDTA)
Intangibility	Intangible assets/Total assets (Intang)
	P/E (Price to Earnings) (PE)
	P/B (Price to Book) (PB)
Tangibility	Fixed Assets/Total assets (FATA)
	Cash flow Invest/total assets. Cash flow Invest is the cash flow from investing activities (CFITA)
	Fixed Assets/Total Sales (FATS)
Dividend	Equity dividend as % of PAT. PAT refers to profit after tax (PDIVPAT)
	Dividend/Sales (DIVSA)
Cash flow	PBITDA/Total Income. PBITDA refers to profit before income, tax, depreciation and amortization (PBDITAT)
	PBITDA/Total Assets (PDDITTA)
	PBT/Sales PBT denotes profit before tax (PBTSA)
	PBT/Total Assets (PBTTA)
	Net cash flow from operating activities/Sales (NCFOSA)
	Net cash flow from operating activities/Assets (NCFOTA)

Latent variables	Indicators and variable definitions
Growth	Sales growth: The sales growth rate was calculated as the average sales growth during the latest five-year period (SG)
	Asset growth: The asset growth rate was calculated as the average asset growth during the latest five-year period (AG)
	PBDIT growth: The PBDIT growth rate was calculated as the average pbdit growth during the latest five-year period (PBDITG)
	Operating Cash flow growth: This growth rate was estimated on the basis of five-year average growth rate during the latest five-year period (OCFG)
Size	Log Assets (LOGTA)
	Log Sales (LOGSA)
Tax	Corporate Tax Provision/PBDITA (TAXPBDI)
	Corporate Tax Provision/Sales (TAXSA)
	Corporate Tax Provision/PBT (TAXPBT)
Discretionary expenses	R&D/Total Assets (RDTA)
	Advertisement/Total Assets (ADVTA)
	R&D/Total Sales (RDTSA)
	Advertisement/Sales (ADVSA)
Agency cost	Total Sales/Total Assets (TSA).
	Selling Expenses/Sales (SE)
	Selling Expense/Total Assets (SETA)
	Communication Expenses/Sales (COMMSA)
	Traveling Expenses/Sales (TSESA)
	Selling Expenses/PBDITA (SEPBIDTA)
	Printing Expenses/Sales (PRINTSA)
Profit	Net Profit Margin (NPM)
	Return on Net Worth (RONW)
	Return on Capital Employed (ROCE)
	Return on Total Assets (RTA)
Value	Enterprise Value/Sales (EVS)
	Enterprise value/PBDIT (EVPBDIT)
	Book Value per share (BV)
	Enterprise Value /PBT (EVPBT)
Liquidity	Current ratio (times) (CR)
	Quick ratio (times) (QR)
	Cash to current liabilities (times) (CACL)
	Cash & bank balance as % of current assets (CBCA)

Appendix 2

Combined loadings and cross loadings

	Leverage	Intang	Dividend	Cashflow	Growth	Size	TAX	Discree	Agency	Liquid	Profits
TDTA	0.783	-0.021	-0.074	-0.292	0.055	-0.104	0.031	0.096	0.073	-0.179	-0.344
LTDTA	0.634	0.021	-0.066	-0.027	-0.081	0.143	0.016	0.002	-0.009	-0.047	-0.099
DER	0.643	0.051	-0.007	-0.073	0.039	0.023	0.048	0.067	0.037	-0.039	-0.034
DCR	0.75	0.011	-0.048	0.054	-0.067	0.289	-0.04	-0.07	-0.094	-0.177	0.005
PE	-0.005	0.948	0.064	-0.068	0.075	-0.076	0.114	0.151	0.159	0.069	-0.015
PB	0.047	0.948	0.081	0.004	0.079	-0.02	0.107	0.128	0.137	0.045	0.046
PDIVPAT	-0.114	-0.03	0.704	0.305	-0.143	0.224	0.02	-0.043	-0.059	-0.008	0.271
DIVSA	0.016	0.138	0.704	-0.327	0.134	-0.206	0.597	0.826	0.723	0.173	-0.013
PBTSA	-0.168	-0.047	-0.116	0.805	-0.121	0.257	-0.314	-0.509	-0.451	-0.017	0.617
NCFOSA	-0.002	-0.088	-0.295	0.665	-0.241	0.327	-0.371	-0.585	-0.526	-0.11	0.159
PDDITTA	-0.091	-0.052	0.012	0.849	-0.108	0.291	-0.184	-0.289	-0.268	-0.018	0.641
PBDITAT	-0.022	0.098	0.192	0.549	0.024	0.032	0.085	0.077	0.048	0.196	0.39
PBTTA	-0.22	-0.01	0.13	0.807	-0.064	0.235	-0.084	-0.173	-0.182	0.071	0.837
NCFOTA	-0.014	-0.044	0.011	0.608	-0.191	0.251	-0.058	-0.129	-0.143	-0.061	0.228
SG	-0.027	0.086	-0.003	-0.174	0.905	-0.357	0.038	0.14	0.131	0.068	-0.032
PBDITG	0.001	0.036	0.018	-0.041	0.694	-0.092	0.014	0.054	0.045	0.024	0.023
AG	-0.021	0.08	-0.032	-0.19	0.88	-0.369	0.031	0.13	0.123	0.065	-0.051
LOGSA	0.067	-0.084	-0.005	0.317	-0.32	0.924	-0.073	-0.165	-0.257	-0.129	0.227
LOGTA	0.164	-0.01	0.029	0.284	-0.289	0.924	-0.046	-0.143	-0.174	-0.068	0.115
TAXPBDI	-0.018	0.036	0.124	0.064	-0.098	0.131	0.786	0.052	0.047	0.006	0.072
TAXSA	0.049	0.147	0.564	-0.403	0.151	-0.232	0.786	0.885	0.771	0.148	-0.059
RDTA_2	0.038	0.135	0.563	-0.377	0.123	-0.187	0.605	0.928	0.756	0.131	-0.044
ADVSA	0.024	0.138	0.47	-0.32	0.12	-0.123	0.502	0.928	0.774	0.104	-0.049
COMMSA	-0.015	0.169	0.386	-0.334	0.144	-0.281	0.448	0.691	0.907	0.116	-0.11
TSA	-0.014	0.172	0.409	-0.299	0.089	-0.202	0.457	0.691	0.896	0.116	-0.093
PRINTSA	0.018	0.159	0.421	-0.318	0.134	-0.24	0.474	0.746	0.897	0.111	-0.069
TSESA	0.02	0.047	0.439	-0.295	0.057	-0.095	0.446	0.763	0.806	0.064	-0.066
CR	-0.137	0.043	0.09	0	0.059	-0.112	0.08	0.11	0.093	0.917	0.078
QR	-0.168	0.055	0.097	0.033	0.057	-0.096	0.077	0.092	0.089	0.962	0.084
CACL	-0.136	0.07	0.141	0.007	0.062	-0.091	0.116	0.152	0.143	0.918	0.065
NPM	-0.138	0.021	0.196	0.523	-0.006	0.109	0.079	0.045	-0.006	0.112	0.812
RONW	-0.106	0.003	0.125	0.565	-0.01	0.152	-0.048	-0.095	-0.124	0.012	0.821
ROCE	-0.172	0.02	0.163	0.612	-0.031	0.186	0	-0.059	-0.098	0.068	0.924
ROA	-0.167	0.013	0.152	0.629	-0.036	0.197	-0.003	-0.064	-0.107	0.09	0.916

	Leverage	Intang	Dividend	Cashflow	Growth	Size	TAX	Discreet	Agency	Liquid	Profits
TDTA	0.783	-0.021	-0.074	-0.292	0.055	-0.104	0.031	0.096	0.073	-0.179	-0.344
LTDTA	0.634	0.021	-0.066	-0.027	-0.081	0.143	0.016	0.002	-0.009	-0.047	-0.099
DER	0.643	0.051	-0.007	-0.073	0.039	0.023	0.048	0.067	0.037	-0.039	-0.034
DCR	0.75	0.011	-0.048	0.054	-0.067	0.289	-0.04	-0.07	-0.094	-0.177	0.005
PE	-0.005	0.948	0.064	-0.068	0.075	-0.076	0.114	0.151	0.159	0.069	-0.015
PB	0.047	0.948	0.081	0.004	0.079	-0.02	0.107	0.128	0.137	0.045	0.046
PDIVPAT	-0.114	-0.03	0.704	0.305	-0.143	0.224	0.02	-0.043	-0.059	-0.008	0.271
DIVSA	0.016	0.138	0.704	-0.327	0.134	-0.206	0.597	0.826	0.723	0.173	-0.013



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