Determinants of dividend payout of construction companies: a panel data analysis

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Abstract

Purpose – This paper aims to examine the determinants of the dividend policy of the construction companies in India.

Design/methodology/approach – Data from 2011 to 2016 (six years) of 45 listed construction companies in India are collected, and a strong balanced panel is created. Dividend per share is dependent variable, and profitability, unstable earnings, institutional holding, cash flow, tangibility, liquidity, growth opportunities, age of the firm, life cycle, leverage, size of firm and taxation are explanatory variables. The panel is tested for stationarity and finally fixed and random-effect panel regression model with robust estimation option is performed.

Findings – The random effect model is found fit with an R^2 of 62 per cent, and profitability, life cycle and size of the firm show a significant positive effect on dividend payment. Cash flow shows a negative significant relationship, indicating the presence of agency problem. Rest of the variables indicated an insignificant relationship.

Research limitations/implications – The study is carried out on a small sample of 45 companies with data of only six years. Further, there may be behavioral and psychological factors that drive the decision to declare dividend. Those factors have not been considered in present study. Despite considerable efforts, the author could not find more studies specific to the construction sector. Hence, the variables identified in the present study are more generic, even though a few sector-specific studies have been included.

Originality/value – The dividend policy determinants for the construction sector in India are investigated, and a comprehensive model based on 12 explanatory variables is tested to find the drivers of dividend payout in Indian construction companies. From the investor's point of view, the sector has immense potential in terms of dividend as well as capital appreciation. Therefore, the study can be useful to the investors to understand the drivers of dividend payout in the construction sector. It can also be crucial for companies to create an appropriate dividend policy so as to attract and retain investors. The study contributes significantly to the existing body of knowledge by recommending the salient drivers of dividend payout in the construction sector based on a comprehensive dataset and using robust methodology.

Keywords India, Profitability, Construction, Dividend, Life cycle

Paper type Research paper

1. Introduction

Framing the dividend policy is one of the most important functions of corporate finance and it has influence on various stakeholders such as investors, managers and lenders. The studies on the dividend policy focus on two specific questions, i.e. does the dividend policy affect the value of the firm and what are the factors that determine the dividend policy? (Labhane and Mahakud, 2016). Earlier studies by Lintner (1956) and Miller and Modigliani (1961) set the base for further development in dividend payout. Lintner (1956) argues that firms target their desired payout ratio, and it is determined by the current earnings and past dividends of the companies, while Miller and Modigliani (1961) find that dividend policy is

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irrelevant in measuring the value of the firm or shareholders' wealth in a perfect market. In fact, Black (1976) opines that "the harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just do not fit together." Several theories have been propounded to explain the dividend payment behavior of firms such as the tax clientele theory proposed by Litzenberger and Ramaswamy (1979) and Elton and Gruber (1970). The signaling theory was developed by Akerlof (1970) and further validated by Aharony and Swary (1980); Bhattacharya (1979). The agency cost theory was validated by Jensen and Meckling (1976); Easterbrook (1984) and Rozeff (1982), and the life cycle theory of dividends was validated by DeAngelo *et al.* (2006).

It is observed in India that among the Bombay Stock Exchange top 500 companies, dividend payout has outpaced the net profit growth and there was a steady increase in the payment of dividend during 2010-2015. At the same time, there are several companies, which despite profits, do not declare dividends regularly. The companies in India declare their dividend payout plan and retention of funds plan under mandatory disclosure policy so as to make the investors aware of their future plans (*Source: ET Bureau, Jul 25, 2016*). This inconsistent pattern of paying dividends without profit growth and not paying dividend even after having sufficient profits and cash takes us to the questions as noted by Aivazian *et al.* (2003) that why companies pay dividend and if such companies consider any of these dividend theories before making their dividend policy. In other words, which factors drive the dividend policy of a company?

In the past 40 years, substantial empirical studies have been carried out in this area and each study offers several factors that affect the dividend policy of a firm. There is emerging consensus that there is no single explanation of the dividends. Some of the studies that have discussed the drivers of the dividend policy in recent times are Basil Al-Najjar (2009); Mollah (2011); Hamill and Al-Shattarat (2012); Patra *et al.* (2012); Labhane and Mahakud (2016); and Kumar and Sujit (2018).

Despite no consensus regarding the drivers of dividend payout, every empirical study in the area of the dividend policy contributes to the existing literature and theory building process.

In the past decade, authors have attempted to study the drivers of the dividend policy from the sector specific point of view and found that the dividend policy is time-, sector- and country-specific. Kumar and Sujit (2018) in their study found the determinants of dividend trends of Indian firms. The study was based on a sample of 31,234 firms representing 15 different industry sectors. Kapoor *et al.* (2010) have done a study in India on the service sector; Khan and Shamim (2017) studied the drivers of dividend policy in Pakistan on 32 sectors and compared the drivers of each sector; George and Kumudha (2005) tested the Lintner model in Hindustan Construction Co. Ltd.; Kamat (2016) studied the industry affiliation of the dividend policy across 20 sectors; and Hudiwijono *et al.* (2018) did a study on the drivers of dividend payout in the construction companies Listed on the Indonesian Stock Exchange. These sector specific studies revealed that the determinants of dividend payout vary from one sector to another.

1.1 Significance, aim and objective of study

As noted above, the determinants of the dividend policy differ from one sector to another. It is of great value to the industry, academia and researchers to find out the factors that are driving the dividend payout for a particular sector.

For this reason, the authors chose to study the determinants of the dividend policy specifically in the construction sector in India. The companies identified are the regular dividend paying companies during the study period. The construction industry contributes

significantly to a country's gross domestic product and plays an important role in employment generation. There is a lot of government push towards the creation of infrastructure that is leading to the emergence of construction companies in India. From the investor's point of view, the sector has huge potential in terms of dividend and capital appreciation. Therefore, the study can be useful to the investors to understand the drivers of dividend payout in the construction sector and also important for companies to create appropriate dividend policy so as to attract and retain investors. The study contributes significantly to the existing body of knowledge by recommending the significant drivers of dividend payout in the construction sector based on a comprehensive dataset and using robust methodology.

2. Literature Review

Miller and Modigliani (1958) started a discussion on capital structure and dividend policy presenting the irrelevance theory. Among the earlier studies, Lintner (1956) found earnings as a driver for dividend, cash flow had a positive effect on dividend according to Brittain (1966) and Higgins (1972) suggested a negative effect of leverage on dividend payout. Litzenberger and Ramaswamy (1979) argue that there is a negative relationship between receiving cash dividends and dividends.

A number of factors have been identified as determinants of the dividend policy in the past which include profit, risk, cash flow, agency cost, growth, firm size, maturity of firm, taxes and many more. Through this literature review, the authors attempt to highlight some of the drivers of the dividend policy in general and the ones specific to the construction sector. Profits are regarded as one of the most primary indicators of a firm's ability to pay dividends. Fama and French (2001) find that dividend paying companies are more profitable, have less valuable growth opportunities and are larger firms in size. Baker *et al.* (1985); Pruitt and Gitman (1991); DeAngelo *et al.* (2004); Amidu and Abor (2006); Basil Al-Najjar (2009); Mollah (2011); Hamill and Al-Shattarat (2012); Patra *et al.* (2012); and Labhane and Mahakud (2016) find a positive relationship between profitability and dividends. Vasantha and Thirumagal (2017) in their study on several sectors in India find that the dividend payout of the infrastructure and construction sector is affected positively by profitability (return on net worth as a measure of profitability). However, Khan and Shamim (2017) note that return on equity (a measure of profitability) has a negative influence on the dividend payout in construction sector in Pakistan. They observe a decreasing trend of dividend payment during 2011-2015. Kumar and Sujit (2018) and Kamat (2016) also note that the Indian construction and real estate companies are among the lowest dividend paying companies despite being profitable. This could be due to the fact that the construction companies need a lot of reinvestment for growth (Khan and Shamim, 2017). However, there is no consistency in terms of using a particular measure of profitability.

Any instability in earnings leads to reduced dividend payments. Therefore, firms with higher earnings volatility pay fewer dividends (Pruitt and Gitman, 1991). Ho (2003); Aivazian *et al.* (2003); Amidu and Abor (2006); Ahmed and Javid (2009); Basil Al-Najjar (2009); Patra *et al.* (2012); and Labhane and Mahakud (2016) have noted a negative and significant relationship between the business risk and dividend policy, which suggests that highly risky firms pay a lower amount of dividends to the shareholders and vice versa. The reason might be that the firms experiencing high volatility in earnings have high uncertainty about the future, which compels them not to pay more dividends. The results are similar across sectors and nations. Liquidity has the potential to influence the dividend payouts and a very important determinant of dividend payout as poor liquidity position will lead to non-payment of dividends. Ho (2003); DeAngelo *et al.* (2004); Patra *et al.* (2012);

Musiega *et al.* (2013); Sikes and Verrecchia (2015); Imad (2016); and Labhane and Mahakud (2016) found that liquidity is positively related to dividend payout. These results are consistent across all sectors.

Institutional shareholders serve the purpose of watchdogs in monitoring the activities of the management due to the high stakes they usually have in companies. The continuous monitoring activities reduce agency costs by aligning the interest of management with that of shareholders. Therefore, a negative relationship is expected between institutional holding and dividend payout. The findings are supported by Amidu and Abor (2006); Anastacia *et al.* (2014) and Short *et al.* (2002), who suggests that dividends and institutional ownership are the alternative signaling devices. The existence of large shareholders (institutional ownership) mitigates the need for dividends to signal good performance; thus, there is no need to give dividends. Vasantha and Thirumagal (2017) in a sector-based study find that institutional holding inversely affects the dividend payout of infrastructure and construction companies in India.

Dividends are paid from the free cash flow available with managers to prevent managers from building unnecessary empires in their own narrow interests and reduce agency cost. Therefore, a positive relationship can be expected between the free cash flow available for the company and the dividend payout ratio (Gomes, 2000; Faccio *et al.*, 2001; Amidu and Abor, 2006; Baker *et al.*, 2007; Fairchild, 2010; Anastacia *et al.*, 2014; Cheng *et al.*, 2014). Imad (2016) also find a negative relationship between free cash flow and dividend payout for Middle East and North African civil law countries. Khan and Shamim (2017) observe a negative relation of free cash flow and dividend in construction and material companies due to the fact that most of the free cash flow available is utilized by the companies for investment growth. The agency problem may also arise between the bondholders and shareholders. Booth *et al.* (2001) assert that asset tangibility may have a positive effect on dividend policy because firms with a high level of tangible assets can use assets as collateral for debt and will rely less on retained earnings. Labhane and Mahakud (2016) suggest that a higher proportion of tangible or collateralizable assets ensure a higher level of protection for the bondholders, thereby reducing the agency problem arising due to the conflicts between the bondholders and shareholders. The tangibility of an asset can be measured as the net fixed assets divided by total assets, and it is expected to have a positive relationship with dividend payout ratio. Aivazian *et al.* (2003) provide a contrary view and find a negative relationship between tangibility and dividend payout. They attribute this to the corresponding drop in short-term assets that are available as collateral for short-term bank debt, which they expect would reduce short-term borrowing capacity in bank dominated markets. Jasim Al-Ajmi and Hussain (2011) also used this driver in their study but found a non-significant negative relation.

Growth opportunities or investment opportunities have been measured in different ways. For instance, Yusof and Ismail (2016) measured it as retained earnings/total assets, Vasantha and Thirumagal (2017) measured it as growth in sales; Amidu and Abor (2006) and Anastacia *et al.* (2014) used market to book ratio and found a negative association between dividend payouts and market to book ratio, indicating that dividend payment tends to be lower in growing companies, which are characterized by lower agency cost. This view is also supported by Holder *et al.* (1998); Ho (2003) and Abor and Bokpin (2010). However, contrary to expectations, Aivazian *et al.* (2003) find a positive relationship between market to book ratio. Dividend policy resolves the agency conflict between debt and equity holders as dividends are unwelcome by debt holders, as they potentially deplete the collateral base available to the debt holders and potentially increase the cost of debt (Abor and Fiador, 2010).

Grullon and Michaely (2002), DeAngelo and DeAngelo (2006), DeAngelo *et al.* (2006), Denis and Osobov (2007), Jasim Al-Ajmi and Hussain (2011) and Labhane and Mahakud (2016) find that the tendency to pay dividends is more as a company's retained earnings to the book value of total equity increase. This is consistent with the belief of the life cycle theory, which says that dividends are paid by mature and established firms, as young firms get relatively abundant investment opportunities with limited resources. This driver of dividend payout is not being used extensively in sector specific studies in the recent times.

Farinas and Moreno (2000) and Huergo and Jaumandreu (2002) have tried to find the relationship of dividend with the age of the firm. Generally, mature companies have stable earnings, high access to external capital market, goodwill and expertise, based on which they are able to maintain a good level of reserves, which enable them to pay higher dividends. Vasantha and Thirumagal (2017) find a positive influence of age on dividend across all sectors.

However, the relationship of age with dividend payouts may not necessarily be positive. As pointed out by Afza and Mirza (2011), companies increase their dividends during the first few years, which according to their estimated results are closer to 20 years, and afterwards, companies on an average start reducing dividends. Large firms have a better access to capital markets and generally depend less on internal funds (Higgins, 1972); therefore, they are able to pay better dividends. The positive effect of size on dividend payout is supported by Ho (2003); Aivazian *et al.* (2006); Jasim Al-Ajmi and Hussain (2011); Yusof and Ismail (2016); and Imad (2016). The inaccessibility of external financing and its high cost if obtained limit the small firms' ability to pay dividends and make them more inclined to retain these funds to finance their future growth. The effect of the size on dividend policy is robust to changing the measurement of size (Jasim Al-Ajmi and Hussain, 2011) such as the natural logarithm of assets or use of total sales.

A few studies also confirm a negative relationship between dividend payments and a firm's size due to the reduced information asymmetry, as large firms have greater information access. However, none of the recent studies have reported a negative relationship. Differentials in tax rates between dividends and capital gains lead to preference for dividend or capital appreciation thus creating clienteles for those payouts (Baker *et al.*, 2007). The countries where the dividend tax is high, an inverse relationship is expected between dividend payout and taxation. Further, as the corporate tax rates increase, earnings after tax reduce; this in turn weakens the companies' capability to pay dividends. Anastacia *et al.* (2014) find a negative relationship between corporate taxation and dividend payout, which is contrary to the view of their previous study (Amidu and Abor, 2006).

Firms with a high level of debt prefer to cut dividends, voluntarily or under creditors' pressure, to maintain the cash needed to fulfill their obligations towards corporate debt holders (Talat Afza and Mirza, 2011). Leverage is one of the critical determinants of dividend policy according to various authors. The firms with a low debt ratio tend to distribute higher dividends and vice versa. The negative relation is supported through the agency cost theory by Aivazian *et al.* (2003), Aivazian *et al.* (2006); Basil Al-Najjar (2009); Jasim Al-Ajmi and Hussain, (2011) and Yusof and Ismail (2016).

The theoretical and empirical evidence discussed in this section provides a background on the factors that determine the dividend policy of firms. A few studies that are sector-specific revealed that profitability, institutional holding and free cash flow negatively influence the dividend payout. Institutional ownership can be a very important factor in the construction sector as most of the construction firms in India are closely held and the institutional ownership is quite low. A few papers also discuss the effect of the lagged dividend on dividend payout. Different measures of profitability, size of firm, institutional

holding, tangibility and cash flow have been used in the empirical work discussed in the literature review. The present study is a holistic attempt to find out the drivers of the dividend payout in construction companies in India using 12 independent variables. Table I provides a brief summary of few prominent studies that have used these 12 variables in their respective work. The Table shows the relationship they observed between dividend payout and the chosen independent variable along with the methodology used.

3. Research Methodology

3.1 Sample

The present study examines the determinants of the dividend policy of listed construction and related firms in India. The Center for Monitoring Indian Economy (CMIE) data base was explored to find out such companies. Initially, a total of 153 companies were found that are listed in this category. However, due to the non-availability of comprehensive data on all the variables and after the removal of non-dividend paying companies, the final data set is reduced to 45 companies for a period of six years from 2011 to 2016.

3.2 Variables

The explanatory variables used in the present study to explain dividend payout are given as follows:

- profitability measured through profit before interest and tax/total asset;
- unstable earnings measured in terms of standard deviation of profit before interest and tax/total asset;
- institutional holding;
- cash flow measured as operating cash flow/total asset;
- fixed asset/total asset, which is named as tangibility;
- liquidity measured a current asset/current liability;
- growth opportunities/investment opportunities measured as the market price of share/book value of share;
- age of the firm;
- life cycle as retained earnings/equity;
- leverage as total debt/total asset;
- size as log total asset; and
- taxation as corporate tax/profit before interest and tax.

The dependent variable is dividend per share. The choice of the above-mentioned variables is influenced by the available empirical literature and data are obtained from the CMIE, Prowess.

3.3 Modeling Method

Al-Malkawi (2007) have used the logit and probit model in their paper. The logit and probit model is used to answer the question why some firms are paying dividends and others are not. The logit and probit model is used in case the dependent variable is binary (Labhane and Mahakud, 2016). Some past studies have used cross-sectional analysis for such studies. Cross-sectional data are a type of data which are collected at a particular point of time. In our case, the data are repeated over several years (2011-2016). Hsiao (1986) points out that panel

Table I.
References for variables

Variable	Abor and Bokpin (2010)	Afza and Mirza (2011)	Al-Ajmi and Hussain (2011)	Al-Malkawi (2007)	Anastacia *et al.* (2014)	Hudiwijono *et al.* (2018)*	Imad (2016)	Khan and Shamim (2017)	Kumar and Sujit (2018)	Labhane and Mahakud (2016)	Patra *et al.* (2012)	Vasantha and Thirumagal (2017)	Yusof and Ismail (2016)
Profitability	+ve	+ve	+ve	+ve	+ve	NS	+ve	+ve	+ve	+ve	+ve	+ve	+ve
Unstable earnings	NS				−ve	NS				−ve			−ve
Liquidity						NS	+ve		+ve	+ve	+ve		NS
Institutional Holding				−ve								−ve	
Cash flow			+ve			NS	−ve	−ve		+ve			NS
Tangibility			NS		+ve					−ve			
Growth Opportunities as MP/BP	−ve			NS	NS		−ve		−ve	−ve	−ve		+ve
Life Cycle			+ve							+ve			
Age of the firm		+ve		+ve								+ve	
Size of the firm	+ve		+ve	+ve	+ve	−ve	+ve		+ve	+ve	+ve		+ve
Taxation				NS	NS					−ve			
Leverage	NS	−ve	NS	−ve		+ve	−ve			−ve	−ve		−ve
Method used	Panel	Panel	Panel	Panel and Tobit	Panel	OLS	Panel	Panel	PLS-SEM	Panel	Panel	Panel	Panel

Notes: NS-Not Significant; PLS–SEM–Partial Least Square-Structural Equation Modeling; *Construction Specific Study
Source: Authors' self-generated

data analysis is best suited for such studies as it incorporates the role of unobservable firm-specific and time-specific factors with other quantifiable factors on determination of dependent variable. Considering this advantage of panel data analysis over the cross-sectional analysis, panel data models have been used for this study.

Panel data consist of a group of cross-sectional units which are observed over time (Hill, *et al.*, 2007), as in our case, 45 companies spread over six years' data set. The panel so formed is strongly balanced and is analyzed using STATA. The preliminary analyses of correlation and variance inflation factor (VIF) indicated that the data were free from multicollinearity. There are several tests available to test stationarity, but after the publication of a paper by Levin and Lin (1992, 1993), it is generally accepted that the commonly used unit root tests such as the Dickey–Fuller, augmented Dickey–Fuller and Phillips–Perron tests lack power in distinguishing the unit root for panel data (Maddala and Wu, 1999). Therefore, the authors tested the data for stationarity using the Levin–Lin–Chu test (2002). The panel data also suffer from the problem of heteroskedasticity and the robust estimation of fixed-effect and random-effect model ensures that the data are free from heteroskedasticity (Yusof and Ismail, 2016). Therefore, to account for autocorrelation and heteroskedasticity in the panel, robust estimates are used. The panel data are analyzed using either fixed effect or random effect. Fixed-effects are constant across individuals, and random effects vary (Leeuw and Kreft, 1998). When a sample exhausts the population, the corresponding variable is fixed; when the sample is a small (i.e. negligible) part of the population, the corresponding variable is random (Green and Tukey, 1960). Nwakuya and Ijomah (2017) state that the fixed-effect model controls all the time-invariant differences between the individuals. Therefore, the estimated coefficients of the fixed effect model cannot be biased because of omitted time-invariant characteristics. On the other hand, the rationale behind the random-effect model is that the individual specific effect or variation across entities is assumed to be a random variable that is uncorrelated with the predictor/explanatory variables. This study uses both fixed- and random-effect models.

The panel regression equation differs from a regular time series or cross section regression by the double subscript attached to each variable (Amidu and Abor, 2006):

$$Y_{i,t} = \alpha_i + \beta X_{i,t} + e_{i,t} \tag{1}$$

Here, i denotes the cross-sectional dimension and t represents the time-series dimension. $Y_{i,t}$ is dependent variable, i.e. dividend per share, α_i is constant over time and specific to an individual cross section firm i. β is the coefficient of explanatory variable and X is the explanatory variable. e is an error or residual.

The full model is as follows.

$$\begin{aligned} D_{i,t} = {} & \beta_0 + \beta_1 PROF_{i,t} + \beta_2 UE_{i,t} + \beta_3 INS\_HOL_{i,t} + \beta_4 CF_{i,t} + \beta_5 TANG_{i,t} + \beta_6 LIQ_{i,t} \\ & + \beta_7 GRO_{i,t} + \beta_8 AGE_{i,t} + \beta_9 LIFE\_CYCLE_{i,t} + \beta_{10} LEV_{i,t} + \beta_{11} SIZE_{i,t} \\ & + \beta_{12} TAXATION_{i,t} + e_{i,t} \end{aligned}$$

Where:

D = Dividend;
PROF = Profitability;
UE = Unstable Earnings;
INS_HOL = Institutional holding;

CF = Cash Flow;
TANG = Tangibility;
LIQ = Liquidity;
GRO = Growth opportunities;
AGE = Age of the firm;
LIFE_CYCLE = Life cycle;
LEV = Leverage;
SIZE = Size of the firm; and
TAXATION = Taxation.

Table II highlights the expected relationship between the dependent variable and explanatory variable. These expected signs are in accordance with the literature review.

4. Results

4.1 Descriptive Analysis and correlations

The data presented in Table III is descriptive statistics of all the variables. The data indicate that the average dividend per share paid by companies is Rs. 2.29, with a maximum of Rs. 18.24. The profitability varies from negative 15.22 to positive 25.59 per cent. A little further exploration of the data revealed that companies such as Aban Offshore, Ansal Housing and Construction Limited, Atlanta Ltd., DSK Kulkarni Developers, Vipul Limited, ITD Cementation and JMC Projects India Limited. are paying regular dividends despite having suffered losses during certain years. This suggests that the dividend payout of a firm has reasons beyond profitability. This requires a detailed exploration and may be considered as a limitation of the work at present. Average institutional holding in construction companies in India is 16.4 per cent, with a maximum of 57.8 per cent and a minimum of 0 per cent. Operating cash flow to total assets is very low at 0.024 per cent on average and a maximum of 0.27 per cent. The construction companies are expected to have a lot of fixed assets; however, it is observed that the average fixed assets to total assets held are only 19.89 per cent, with a maximum of 90 per cent and the lowest of only 0.16 per cent. One possible

S. no.	Factor	Represented by	Measure	Expected sign
1	Profitability	PROF	Profit before interest and tax/ total asset	+ve
2	Unstable earnings	UE	Standard deviation of profit before interest and tax/total asset	−ve
3	Institutional holding	INS_HOL	Institutional holding	+ve/−ve
4	Cash flow	CF	Operating cash flow/total assets	+ve
5	Tangibility	TANG	Fixed assets/total assets	+ve/−ve
6	Liquidity	LIQ	Current assets/current liabilities	+ve
7	Growth opportunities	GRO	Market value of share/book value of share	+ve/−ve
8	Age of the firm	AGE	Age of the firm	+ve/−ve
9	Life cycle	LIFE_CYCLE	Retained earnings/equity	+ve
10	Leverage	LEV	Total debt/total assets	−ve
11	Size of firm	SIZE	Log of total assets	+ve
12	Taxation	TAXATION	Corporate tax/PBIT	+ve

Source: Authors' self-generated

Table II. Expected relation based on literature review

Table III.
Descriptive Statistics-Overall

Variable	*N* Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. deviation Statistic	Skewness Statistic	Skewness Std. error	Kurtosis Statistic	Kurtosis Std. error
D	270	0.00	18.24	2.2996	2.80364	2.838	0.148	10.242	0.295
PROF	270	−15.22	25.59	3.3096	3.64557	0.374	0.148	7.714	0.295
UE	270	0.00	11.59	1.1723	1.58645	3.379	0.148	15.416	0.295
INS_HOL	270	0.00	57.83	16.4092	15.73376	0.746	0.148	−0.456	0.295
CF	270	−0.40	0.27	0.0246	0.07435	−1.052	0.148	4.897	0.295
TANG	270	0.16	90.03	19.8902	19.56065	1.724	0.148	2.734	0.295
LIQ	270	0.47	112.29	3.4653	10.92662	8.399	0.148	75.538	0.295
GRO	270	0.18	9.21	1.4714	1.38928	2.524	0.148	8.766	0.295
AGE	270	6.00	111.00	30.9222	19.68463	2.203	0.148	5.069	0.295
LIFE_CYCLE	270	−14.39	200.09	16.0258	32.54333	3.900	0.148	15.805	0.295
LEV	270	0.00	0.77	0.3104	0.17705	0.322	0.148	−0.375	0.295
SIZE	270	7.18	14.58	10.2488	1.45502	0.432	0.148	0.387	0.295
TAXATION	270	−7.49	2.05	0.2097	0.81739	−6.225	0.148	48.587	0.295

Source: Authors' own calculation, base data collated through Prowess

reason for this can be that the construction companies in India do not own a lot of construction equipment and procure it on lease, though it may require further exploration. The market price of a share compared to the book value of the share on average is 1.47, which is below the acceptable levels of 3-4 prevailing in Indian markets. The average age of a firm is 30 years, with retained earnings as a percentage of equity capital of 16 per cent. The average debt level of construction companies in India is 31 per cent, which is very high. As per estimates, the total debt of Indian construction companies was more than one lakh crore by 2017.

Table IV presents a year wise scenario, and one can observe that the dividend per share is on decline year on year basis, so is the profitability. The liquidity position is also on decline during the study period as it was 5.04 in 2011 and came down to 2.42 in 2016. The rest of the study variables are stable.

The correlation matrix given in Table V indicates that the dividend per share has a significant positive correlation with profitability (0.204), institutional holding (0.423), tangibility (0.151), growth opportunities (0.200), life cycle (0.756), leverage (0.120) and size of the firm (0.495). It has a significant negative relationship with unstable earnings (0.121). There are certain cross correlations among the explanatory variables such as size has a significant and strong positive correlation with institutional holding (0.624), life cycle (0.517), leverage (0.464), cash flow (0.222), growth opportunities 9.205) and tangibility (0.375) and a negative relationship with profitability (−0.224), unstable earnings (−0.261) and liquidity (−2.78); tangibility has a significant positive relationship with institutional holding (0.170) and cash flow (0.279); liquidity has a significant negative relationship with institutional holding (−0.177) and cash flow (−0.171); life cycle has a positive association with institutional holding (0.396), tangibility (0.241) and age (0.295). This raises doubt about multicollinearity in the data. However, the data are tested for multicollinearity using the VIF test, and all the results are presented in Table VI. All the VIF values are below 3, which is within the acceptable range.

4.2 Panel data regression test results

As discussed in the methodology section, stationarity of data is one of the essential conditions for panel data analysis. Therefore, the authors decided to use the Levin–Lin–Chu (2002) test to test the hypothesis, i.e. panels are stationary. The results are indicated in Table VII.

We can see from Table VII, that all the variables have p-value $< \alpha$, i.e. 0.05; the authors conclude that none of the variables contains unit root.

The results of the fixed-effect panel regression model and random-effect panel regression model are presented in Tables VIII and IX, respectively. The test results of the fixed-effect model with robust estimates show that only life cycle is a significant determinant of the

Year	D	PROF	UE	INS_HOL	CF	TANG	LIQ	GRO	AGE	LIFE_CYCLE	LEV	SIZE	TAXATION
2011	2.15	4.90	1.29	14.85	0.03	20.82	5.04	1.05	28.42	15.05	0.30	9.92	0.17
2012	2.36	3.67	1.64	15.23	0.02	21.02	6.05	1.32	29.42	17.13	0.31	10.07	0.43
2013	2.41	3.36	1.01	14.86	0.03	20.39	2.87	0.96	30.42	17.52	0.31	10.23	0.24
2014	2.43	2.88	0.74	17.03	0.00	21.43	2.14	1.97	31.42	16.82	0.32	10.37	0.15
2015	2.73	2.74	1.09	18.16	0.03	18.45	2.26	1.93	32.42	15.33	0.32	10.43	0.00
2016	1.50	2.25	1.24	17.93	0.03	16.96	2.42	1.60	33.22	14.03	0.30	10.45	0.27

Source: Authors' own calculation, base data collated through Prowess

Table IV.
Descriptive statistics – year-wise

Table V.
Correlations

Variable	DPS	PROF	UE	INS_HOL	CF	TANG	LIQ	GRO	AGE	LIFE_CYCLE	LEV	SIZE	TAXATION
D	1.00												
PROF	0.204**	1.00											
UE	−0.121*	0.00	1.00										
INS_HOL	0.423**	−0.08	−0.130*	1.00									
CF	0.00	−0.02	−0.10	0.10	1.00								
TANG	0.151*	−0.09	−0.07	0.170**	0.279**	1.00							
LIQ	−0.06	−0.10	0.234**	−0.177**	−0.171**	−0.12	1.00						
GRO	0.200**	0.11	−0.05	0.301**	0.06	0.12	−0.11	1.00					
AGE	0.08	−0.198**	−0.02	0.136*	0.02	0.06	0.10	0.138*	1.00				
LIFE_CYCLE	0.756**	0.04	−0.141*	0.396**	0.02	0.241**	−0.08	0.136*	0.295**	1.00			
LEV	0.120*	−0.315**	−0.144*	0.202**	0.152*	0.470**	−0.287**	−0.129*	0.01	0.168**	1.00		
SIZE	0.495**	−0.224**	−0.261**	0.624**	0.222**	0.375**	−0.278**	0.205**	0.153*	0.517**	0.464**	1.00	
TAXATION	−0.02	0.146*	−0.06	0.04	0.02	−0.12	−0.01	0.05	0.04	−0.05	−0.137*	0.00	1.00

Notes: *Correlation is significant at the 0.05 level (two-tailed); **correlation is significant at the 0.01 level (two-tailed)
Source: Authors' own calculation, base data collated through Prowess

Variable	VIF
PROF	1.365
UE	1.132
INS_HOL	1.785
CF	1.148
TANG	1.498
LIQ	1.285
GRO	1.220
AGE	1.217
LIFE_CYCLE	1.626
LEV	1.859
SIZE	2.856
TAXATION	1.067

Source: Authors' own calculation, base data collated through Prowess

Table VI. Multicollinearity statistics

S. no.	Factor	Statistic	*p*-value	*H0* status
1	D	−2.0e+02	0.0000	Rejected
2	PROF	−35.9784	0.0000	Rejected
3	UE	−54.6759	0.0000	Rejected
4	INS_HOL	−2.9e+02	0.0000	Rejected
5	CF	−1.4e+02	0.0000	Rejected
6	TANG	−22.2031	0.0000	Rejected
7	LIQ	−4.2e+02	0.0000	Rejected
8	GRO	−25.2706	0.0000	Rejected
9	LIFE_CYCLE	−25.3009	0.0000	Rejected
10	LEV	−88.7180	0.0000	Rejected
11	SIZE	−17.1334	0.0000	Rejected
12	TAXATION	−39.85	0.0000	Rejected
13	Age	−46.20	0.0000	Rejected

Notes: Levin-Lin-Chu unit root test *H0*: Panels contain unit roots; number of panels = 45 *Ha*: Panels are stationary; number of periods = 6
Source: Authors' own calculation

Table VII. Stationarity test for panel data

dividend payout in construction firms in India as the $p < \alpha$, i.e. 0.05. None of the other variables are significant drivers of the dividend payout even though, the R^2 of the model is 37 per cent. Despite this, the authors felt that the proposed model was weak and therefore tested the random effect model.

To test the appropriateness of the random effect over the ordinary least square (OLS) pooled regression, Breusch and Pagan Lagrangian multiplier test is conducted. The random-effect is significant, as the *p*-value for the test was below 0.05. Hence, the random-effect model is appropriate to be used.

The results of the random effect generalized least square (GLS) regression model with robust estimates are better and indicate that profitability and life cycle are significant at 5 per cent as the *p*-value is less than α, i.e. 0.05, whereas cash flow and size of the firm are significant at 10 per cent as the *p*-value is less than α, i.e. 0.10. Cash flow has a negative influence on the dividend payout as the coefficient is –1.633. The rest of the variables are insignificant. Overall, the R^2 of the model is 62 per cent, indicating that 62 per cent of the

Fixed effects (witdin) regression dependent variable = DPS			Number of obs =	270
Group variable	Code		Number of groups =	45
R^2: within =	0.2809		F(12,44)	14.88
between =	0.3944		Prob > F	0
overall =	0.3738		corr(u_i, Xb)	−0.3907
(Std. Err. adjusted for 45 clusters in code)				
	Coefficient	Robust Std. Err.	t	*p*
PROF	0.0283	0.0289	0.098	0.333
UE	0.0662	0.0571	1.16	0.252
INS_HOL	−0.013	0.0106	−1.25	0.216
CF	−1.326	0.8293	−1.60	0.117
TANG	0.009	0.0063	1.45	0.153
LIQ	−0.004	0.0030	−1.60	0.117
GRO	0.013	0.0751	0.18	0.857
AGE	−0.094	0.0614	−1.55	0.129
LIFE_CYCLE**	0.0563	0.0080	7.04	0.000
LEV	1.509	1.080	1.40	0.169
SIZE	0.500	0.394	1.27	0.211
TAXATION	0.036	0.0989	0.37	0.711
Constant	−1.385	3.008	−0.46	0.647
sigma_u	2.227			
sigma_e	1.003			
rho (fraction of variance due to u_i)	0.831			

Table VIII.
Fixed-effect model with robust estimates

Notes: **Significant at 5%; *Significant at 10%
Source: Authors' own calculation

variation is dividend is explained by the explanatory factors leaving the 38 per cent variation unexplained. The model is also found to be fit with $p > X^2 = 0.000$, Wald X^2 for 12 DOF = 121.68. Unstable earnings, tangibility, liquidity, growth opportunities, leverage and taxation have a positive but insignificant influence, whereas age of the firm and institutional holding have an insignificant negative influence. Profitability, established as one of the most significant determinants of the dividend payout through the literature review, is found to be a significant positive variable in this study. These results are consistent with most of the extant literature. Baker *et al.*, 1985; Pruitt and Gitman, 1991; DeAngelo *et al.*, 2004; Amidu and Abor, 2006; Basil Al-Najjar, 2009; Mollah, 2011; Hamill and Al-Shattarat, 2012; Patra *et al.*, 2012; and Labhane and Mahakud, 2016 found a positive relationship between profitability and dividends. The results are also consistent with Vasantha and Thirumagal (2017), who find that in the Indian infrastructure and construction sector, the dividend payout is positively driven by profitability. However, it is contrary to the view presented by Khan and Shamim (2017) who note that return on equity (a measure of profitability) has a negative influence on the dividend payout in the construction sector in Pakistan.

Cash flow is affecting the dividend payout negatively. The findings are inconsistent with most of the literature, but confirm the view of Imad (2016) and Khan and Shamim (2017). The literature maintains that payments of high dividend payouts reduce the agency conflicts to some extent by reducing the availability of cash flow in the manager's hand (Gomes, 2000; Faccio *et al.*, 2001; Amidu and Abor, 2006; Baker *et al.*, 2007; Fairchild, 2010; Anastacia *et al.*, 2014; Cheng *et al.*, 2014). Khan and Shamim (2017) find that the construction sector companies in Pakistan show a negative influence of free cash flow on dividends due to the fact that most of the free cash flow available is utilized by the companies for investment growth. However, a negative relationship highlights the presence of agency problem that can

Random effects GLS regression dependent variable = DPS			Number of obs =	270
Group variable	:Code		Number of groups =	45
R^2: within =	0.2607		Wald chi2(12)	121.68
between =	0.6819		Prob > chi2	0.000
overall =	0.6220		corr(u_i, X)	0 (assumed)
(Std. Err. adjusted for 45 clusters in code)				
	Coefficient	Robust Std. Err.	*t*	*p*
PROF**	0.0626	0.0240	2.60	0.009
UE	0.061	0.050	1.21	0.226
INS_HOL	−0.0026	0.0089	−0.27	0.784
CF*	−1.633	0.836	−1.95	0.051
TANG	0.0041	0.0068	0.60	0.546
LIQ	0.0019	0.0034	0.56	0.577
GRO	0.0119	0.0667	0.18	0.858
AGE	−0.0211	0.0151	−1.40	0.163
LIFE_CYCLE**	0.0577	0.0087	6.57	0.000
LEV	0.695	0.8037	0.86	0.387
SIZE*	0.323	0.177	1.82	0.069
TAXATION	0.029	0.094	0.31	0.756
Constant	−1.809	1.696	−1.07	0.286
sigma_u	1.309			
sigma_e	1.003			
rho (fraction of variance due to u_i)	0.630			

Notes: **Significant at 5%; *significant at 10%
Source: Authors' own calculation

Table IX.
Random effect model with robust estimates

lead the project managers to investing excess cash flows in negative net present value (NPV) projects. These results also strengthen the view of Jensen (1986) who suggests that managers are unwilling to share free cash flow with investors and are prone to investing in empire building. The negative relationship also indicates that the amount of free cash flow increases the managerial incentives to deviate from the purported objective of shareholders' value maximization (Imad, 2016). The dividend payout is also driven negatively by institutional holding, even though the relationship is insignificant. This further strengthens the view of the presence of agency conflict in the Indian construction companies. Tangibility which has an insignificant positive influence on the dividend payout also strengthens the same view. The average level of tangible assets held by the construction companies in India is only 19.89 per cent as reported in Table III and is on decline every year as reported in Table IV.

Life cycle, a determinant of divided payout that has not got much attention in the current literature, is a tradeoff between retention and distribution. Mature firms, with little growth opportunities tend to declare dividends. Conforming to the view of DeAngelo *et al.* (2006), our study also finds a positive significant relationship between dividend payout and larger retained earnings. The results are also consistent with the findings of DeAngelo and DeAngelo (2006), Denis and Osobov (2007), Jasim Al-Ajmi and Hussain (2011) and Labhane and Mahakud (2016). This could also be due to the fact that companies in the sample with an average maturity age of 30 years at present do not have enough growth opportunities to invest; therefore, they are paying dividends. Another possible reason for this can be the higher availability of debt indicated through leverage. None of the sector specific studies in the reviewed literature have used life cycle as an explanatory variable.

Size of the firm is also affecting dividend payout positively. Ho (2003), Aivazian *et al.* (2003) and Yusof and Ismail (2016) supported the positive effect of size on dividend payout, confirming that large firms do not necessarily depend on internal funding and have better access to capital market.

A comparative summary of all the results is presented in Table X.

5. Conclusion and discussion

The study is an attempt to understand the drivers of dividend payout in the construction sector in India and to understand, if there are any specific variables that are working in the construction sector. The R^2 of the random effect robust estimate GLS model is 66 per cent and shows some interesting and certain obvious facts. The analysis documents a significant positive influence of profitability, size and life cycle and display a negative influence of cash flow on the dividend payout. The results confirm the findings of DeAngelo and DeAngelo (2006), Denis and Osobov (2007), Jasim Al-Ajmi and Hussain (2011), Labhane and Mahakud (2016), Imad (2016) and Khan and Shamim (2017). The payment of dividend is an effective tool used by large, mature, stable and profitable companies with a high amount of retained earnings in almost every sector and the same is true of the construction sector in India. The payment of a high dividend is also a signal to the current and prospective investors to stay positive in the market and remain invested. Therefore, it is also observed that several companies despite negative profits continue to give dividends. The negative influence of cash flow on dividends is interesting as noted by only Imad (2016) and Khan and Shamim (2017). The negative influence of cash flow on dividend gives rise to the problem of agency conflict. This can be of great importance to the construction sector, as construction projects have a long gestation period and if managers divert cash flow toward negative NPV projects, the results will be hugely disappointing in future.

The work on identification of the determinants of dividend payout is not new in India and across the globe, even the methodology is well established and the variables have been

	Overall model		
Variable	Fixed Effect	Random Effect	Remarks (consistent With literature)/expectation
PROF	+ insignificant	+ *significant*	Consistent with most literature
UE	+ insignificant	+ insignificant	
INS_HOL	−insignificant	−insignificant	
CF	−insignificant	− *significant*	Consistent with Imad (2016) and Khan and Shamim (2017)
TANG	+ insignificant	+ insignificant	
LIQ	−insignificant	+ insignificant	
GRO	+ insignificant	+ insignificant	
	−insignificant	−insignificant	
LIFE_CYCLE	+ *significant*	+ *significant*	Consistent with DeAngelo *et al.* (2006) and most literature
LEV	+ insignificant	+ insignificant	
SIZE	+ insignificant	+ *significant*	Consistent with most literature
TAXATION	+ insignificant	+ insignificant	
Constant	−insignificant	−insignificant	
Remarks		Best model Fit based on R^2	

Table X.
Model Summary

Source: Authors' self-generated

well defined throughout the literature. The present study attempted the whole work from an entirely new perspective with an exclusive focus on construction companies in India, a sector which is of great importance to the Indian investors and government. However, research studies on construction sector are very few in India, more specifically in the domain of corporate finance. The paper has also documented the previous studies starting from early 1960s to recent ones in the 2018. The study has used almost every variable that was discussed by researchers in detail and attempted to synthesize the diverse views.

The variables, profitability and size that have a positive influence on the dividend payout seem generic and are important drivers across sectors and nations; therefore, they are equally important for the construction companies in India. It was noticed during the literature review that life cycle was not extensively used as a driver of dividend; however, the authors chose to use that and found it having a significant positive influence.

Life cycle and cash flow are two variables that seem more specific to the construction sector; however, further exploration is needed to generalize the findings for the construction sector.

Despite all efforts, the paper is not without limitations. The study is carried out on a small sample of 45 companies with data of only six years. As noted earlier also, the dividend payments by companies are a signal of strength and companies do that to retain and attract new investors, without being profitable, or having sufficient funds. This needs an understanding of why the investors prefer dividend and why companies pay dividend, which is more of a behavioral domain and beyond the scope of the study. Despite considerable efforts, the authors could not find more studies specific to the construction sector. Hence, the variables identified in the present study such as profitability and size are more generic, even though a few sector specific studies have been included. Certain variables have been used in the study such as life cycle and cash flow, which are more sectors specific.

Despite limitations, the study is important from the investor's point of view. The construction sector has huge potential in terms of dividend and the capital appreciation for current and prospective investors. The study gives the investors an understanding of the drivers of the dividend payout in the construction sector. The study uses a very comprehensive dataset and a robust methodology. The study in its present shape can work as a basis for the future construction-specific studies to generalize the drivers of the dividend payout.

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