International Journal of Advanced Research in Management and Social Sciences
ISSN: 2278-6236
Impact Factor: 6.284

# DETERMINANTS OF DIVIDEND POLICY OF SELECT COMPANIES IN INDIAN CEMENT INDUSTRY – A STRUCTURAL EQUATION MODELING

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**Abstract:** *Dividend policy plays an indispensable role because it determines what funds flow to investors and what funds are retained by the firm for future reinvestment. It affects firm value as a result of distributing the output from investment and financing decision to stockholders. Dividend can also provide important information to the stockholders regarding the firm's performance. This is referred to as a signaling effect. Through the signaling effect managers are subject to the pressure form capital market that they have to pay optimal amount of dividend to stockholders, and this mechanism plays the role of monitoring managers, and therefore, solving what's called agency problem. Dividend policy is a one of the most debated topics and a core theory of corporate finance which still keeps its prominent place. The present study deals with the main objectives to analyze the dividend determinants of Select Companies in Indian Cement Industry. A sample of twenty three cement companies listed at Bombay Stock Exchange (BSE) has been selected on the basis of continuously paid dividend during the study period of ten years from 2003-2004 to 2012-2013. For this purpose, various key factors affecting equity dividend have been taken such as Earnings per share Dividend per share, Age of the firm, Size of the firm, Growth of the firm, Tangibility of the firm, Debt equity ratio, Operating profit ratio, Net profit ratio, Net profit to Net worth ratio, Dividend Payout ratio and Operating cost ratio. And also inferred that the regression coefficient of the exogenous variables with the critical ratio of all the manifest variables are above the table value of 2.962 and it is significant at 1 percent level except TANG and DPR. Among the selected variables ten variables are the most influenced factors to determine the dividend policy of select companies in cement industry.*

***Keywords:*** *Dividend policy, Determinants of dividend, Cement Industry and Structural Equation modeling.*

## INTRODUCTION

Dividend policy is a very important issue because it determines what funds flow to investors and what funds are retained by the firm for future reinvestment. It affects firm value as a result of distributing the output from investment and financing decision to stockholders. Dividend can also provide important information to the stockholders regarding the firm's performance. This is referred to as a signaling effect. Through the signaling effect managers are subject to the pressure form capital market that they have to pay optimal amount of dividend to stockholders, and this mechanism plays the role of monitoring managers, and therefore, solving what's called agency problem. Dividend policy is a one of the most debated topics and a core theory of corporate finance which still keeps its prominent place.

Many researchers presented various theories and uncountable empirical evidences, but the issue is still unresolved and open for further discussion. It is among top ten unresolved problems in the finance literature and we have not an adequate explanation for the observed dividend behavior of the firms [Black (1976), Allen and Michaely (2003) and Brealey and Myers (2005)]. In developed economies, the decision whether paying dividends or keep as retained earnings has-been taken very carefully by both investors and the management of the firm (Glen et al. 1995).

Black (1976) wrote that "the harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just do not fit together". There are several reasons whether firms should pay dividends or not. The "dividend puzzle"; why firms pay dividends and stock holders pay attention to dividends and still unresolved. Many hypotheses have been drawn to shed some light on this puzzle but the problem still exists. Normally a firm faces the problem of allocation of earnings, whether to distribute among shareholders or retaining for reinvestment and promote the firm growth. Retained earning is a main internal source of financing, but higher retained earning mean fewer dividends and vice versa.

Lintner (1956) found that the most important factor influencing dividend decisions is the association between present earnings and the dividend rate. A few years later, Jensen et al. (1992) also asserted a positive link between dividends and current profitability that can be measured by the ratio of operating income to total assets. Fama and French (2002) suggested that this relationship happens in order to mitigate the agency problem as enterprises with higher profits have more free cash flows; additionally, more profitable

firms can still pay greater dividends without financing investments with risky debt and equity in accordance with the pecking order model.

## OBJECTIVE

The current study main objective is to analyze the dividend determinants of Select Companies in Indian Cement Industry.

## RESEARCH METHODOLOGY

A sample of twenty three cement companies listed at Bombay Stock Exchange (BSE) has been selected on the basis of continuously paid dividend during the study period of ten years from 2003-2004 to 2012-2013. For this purpose, various key factors affecting equity dividend have been taken such as Earnings per share Dividend per share, Age of the firm, Size of the firm, Growth of the firm, Tangibility of the firm, Debt equity ratio, Operating profit ratio, Net profit ratio, Net profit to Net worth ratio, Dividend Payout ratio and Operating cost ratio.

**TABLE 1. DESCRIPTION OF VARIABLES**

| | MANIFEST VARIABLES | DEFINITION | LATENT VARIABLES |
|---|---|---|---|
| **EPS** | Earnings per share | Net profit/total shares | F1(ED)= Earnings and Dividend |
| **DPS** | Dividend per share | Dividend/total shares | |
| **AGE** | Age of the firm | Age of the firm | F2(CD)=Capital Structure Determinants |
| **SIZE** | Size of the firm | Log of Total Assets | |
| **GROW** | Growth of the firm | % Change in Total Assets | |
| **TANG** | Tangibility of the firm | Total Fixed Assets/Total Assets | |
| **DER** | Debt equity ratio | Outsiders fund/Shareholders fund | |
| **OPR** | Operating profit ratio | Operating profit/Net Sales | F3(PR) = Profitability of the firm |
| **NPR** | Net profit ratio | Net profit/Net Sales | |
| **NPNW** | Net profit to Net worth ratio | Net Profit/Net Sales | |
| **DPR** | Dividend Payout ratio | Dividend Per share/Earnings Per Share | |
| **OCR** | Operating cost ratio | Operating Cost / Net Sales | |

## STRUCTURAL EQUATION MODELING (SEM)

SEM is a statistical technique for testing and estimating causal relations using a combination of statistical data and qualitative causal assumptions. It is a versatile statistical modeling tool. Its estimation techniques, modeling capacities, and breadth of applications are expanding rapidly. Structural equation models (SEMs) report findings in three different ways. Understanding the way statistical significance is reported requires understanding the

terminology of the model itself. Within the graphical display of the model there are boxes and arrows. Boxes represent observed data and the arrows represent assumed causation. Within the model a variable that receives a one-way directional influence from some other variable in the system is termed "endogenous", or is dependent. A variable that does not receive a directional influence from any other variable in the system is termed as "exogenous" or is independent. Hence, this research has been conducted by using Structural Equation Modeling.

## RESEARCH MODEL

The research hypotheses have been defined on the basis of dividend determinants of Select Companies in Indian Cement Industry.

## HYPOTHESIS FORMULATION

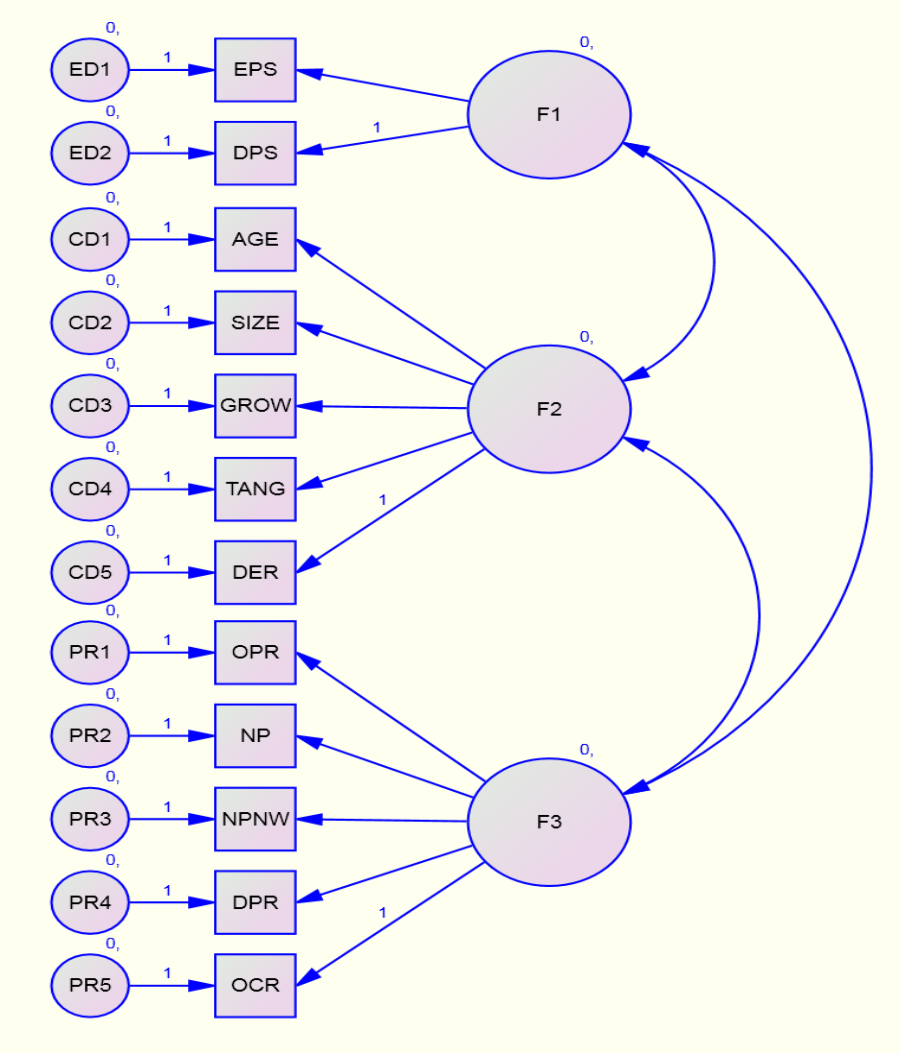
"**The mentioned variables are positively correlated with the dividend determinants of Select Companies in Indian Cement Industry".** The figure 1 is a graphical presentation of the developed hypothetical model.

**TABLE 2. DETERMINANTS OF DIVIDEND**

**VARIABLES SPECIFICATION**

| | MANIFEST VARIABLES | LATENT VARIABLES |
|---|---|---|
| **EPS** | Earnings per share | F1(ED)= Earnings and Dividend |
| **DPS** | Dividend per share | |
| **AGE** | Age of the firm | F2(CD)=Capital structure Determinants |
| **SIZE** | Size of the firm | |
| **GROW** | Growth of the firm | |
| **TANG** | Tangibility of the firm | |
| **DER** | Debt equity ratio | |
| **OPR** | Operating profit ratio | F3(PR) = Profitability of the firm |
| **NPR** | Net profit ratio | |
| **NPNW** | Net profit to Net worth ratio | |
| **DPR** | Dividend Payout ratio | |
| **OCR** | Operating cost ratio | |

**FIGURE 1. RESEARCH MODEL SPECIFICATION**




## CO-VARIANCE MATRIX

In probability theory and statistics, a covariance matrix (also known as dispersion matrix or variance covariance matrix) is a matrix whose element in the *i*, *j* position is the covariance between the $i^{th}$ and $j^{th}$ elements of a random vector (that is, of a vector of random variables). Each element of the vector is a scalar random variable, either with a finite number of observed empirical values or with a finite or infinite number of potential values specified by a theoretical joint probability distribution of all the random variables.

Intuitively, the covariance matrix generalizes the notion of variance to multiple dimensions. As an example, the variation in a collection of random points in two-dimensional space cannot be characterized fully by a single number, nor would the variances in the *x* and *y* directions contain all of the necessary information; a 2×2 matrix would be necessary to fully characterize the two-dimensional variation.

ISSN: 2278-6236
Impact Factor: 6.284

**TABLE 3. CO-VARIANCE MATRIX – CEMENT INDUSTRY**

| | EPS | DPS | AGE | SIZE | GROW | TANG | DER | OPR | NP | NPNW | DPR | OCR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPS | 479.1301 | | | | | | | | | | | |
| DPS | 89.31724 | 16.94896 | | | | | | | | | | |
| AGE | 73.31667 | 13.90833 | 11.91667 | | | | | | | | | |
| SIZE | 5.517167 | 1.045575 | 0.8925 | 0.071731 | | | | | | | | |
| GROW | 6.462367 | 1.230775 | 1.055 | 0.079581 | 0.093731 | | | | | | | |
| TANG | -0.04711 | -0.00875 | -0.00833 | -0.00074 | -0.00073 | 1.39E-05 | | | | | | |
| DER | 164.3286 | 31.54628 | 27.89167 | 2.168022 | 2.497522 | -0.02206 | 70.06898 | | | | | |
| OPR | 2836.833 | 527.9413 | 238.0071 | 25.52311 | 20.15305 | 0.128151 | 83.26395 | 685904.2 | | | | |
| NP | 1579.16 | 289.2852 | 171.5558 | 14.83752 | 14.66441 | 0.024114 | 209.9432 | 266705.2 | 105382 | | | |
| NPNW | 96.61745 | 17.80772 | 12.68875 | 0.923674 | 1.111682 | -0.00292 | 24.15452 | 1232.415 | 566.6689 | 29.35287 | | |
| DPR | -0.85197 | -0.16805 | -0.13625 | -0.00754 | -0.0125 | -0.0001 | -0.29774 | -8.62281 | -5.5889 | -0.23943 | 0.007452 | |
| OCR | 504.9751 | 94.6824 | 71.99708 | 5.264046 | 6.332521 | -0.03143 | 149.8137 | 3484.473 | 1671.178 | 117.783 | -0.98015 | 657.7673 |

| | |
|---|---|
| **EPS** | Earnings per share |
| **DPS** | Dividend per share |
| **AGE** | Age of the firm |
| **SIZE** | Size of the firm |
| **GROW** | Growth of the firm |
| **TANG** | Tangibility of the firm |
| **DER** | Debt equity ratio |
| **OPR** | Operating profit ratio |
| **NPR** | Net profit ratio |
| **NPNW** | Net profit to Net worth ratio |
| **DPR** | Dividend Payout ratio |
| **OCR** | Operating cost ratio |

**FIGURE 2. UNSTANDARDISED ESTIMATES**

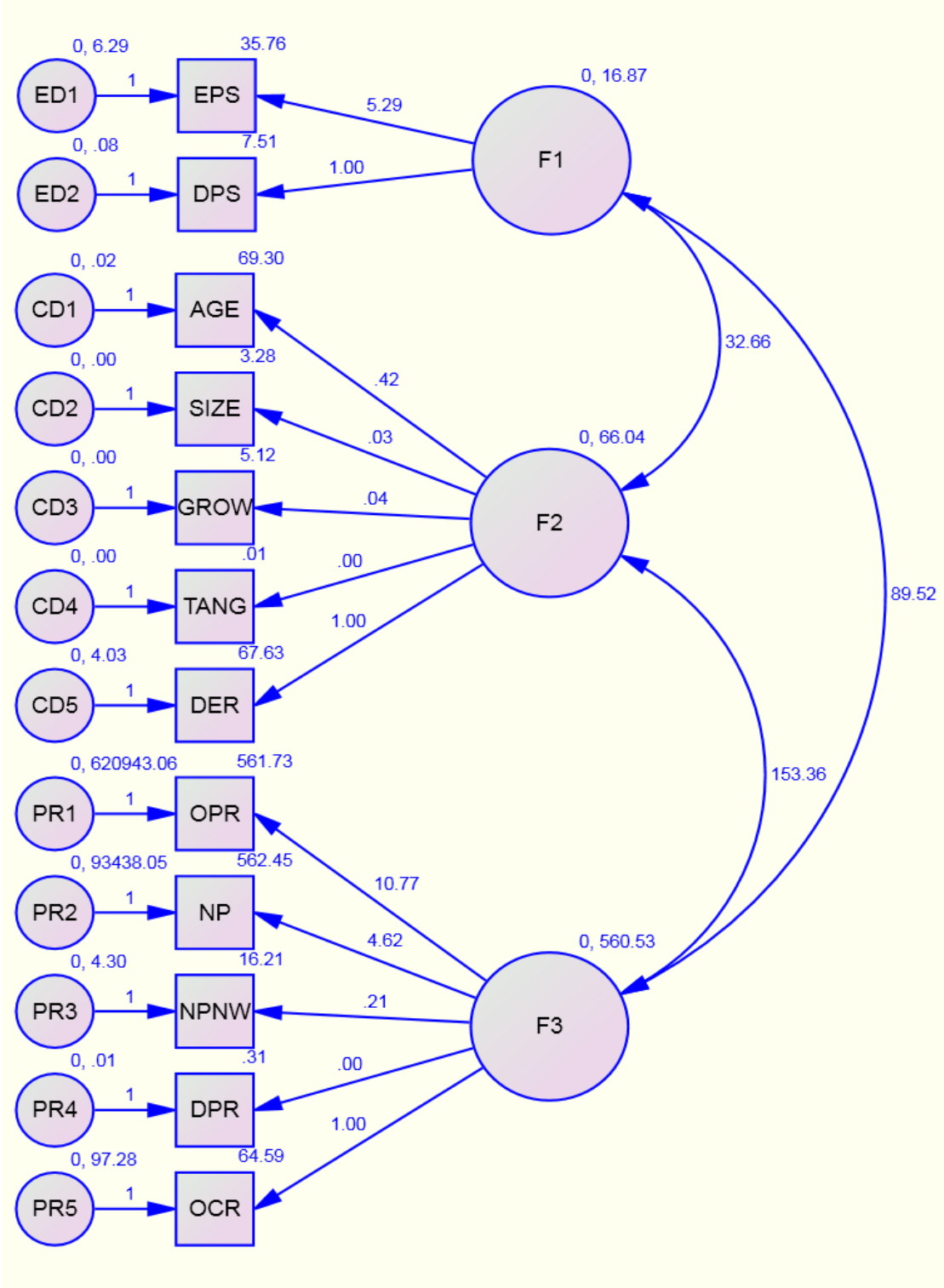
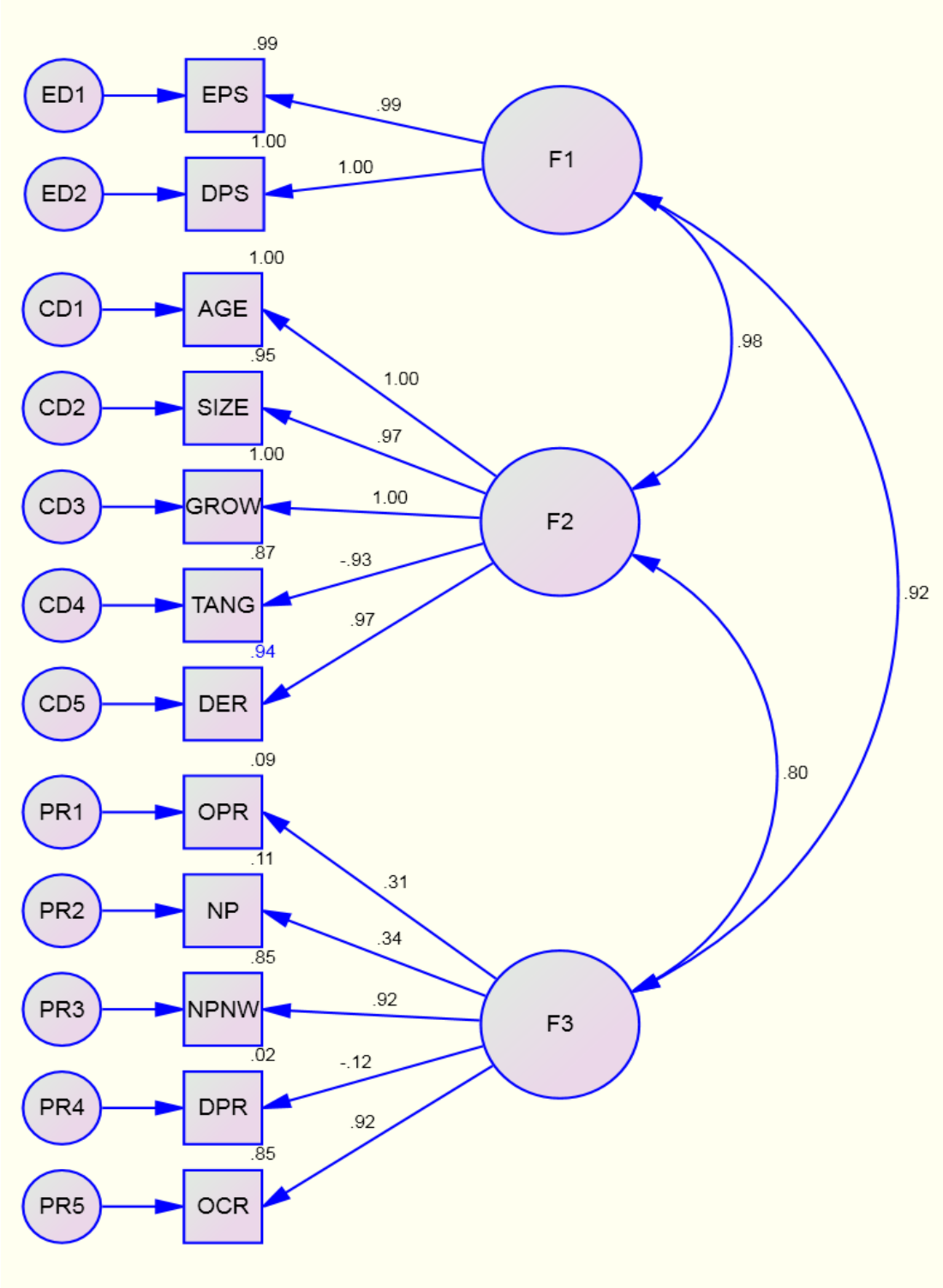


**FIGURE 3. STANDARDISED ESTIMATES**




## TESTING OF HYPOTHESES – STANDARDISED ESTIMATES

The following table represents the hypotheses with regard to the determinants of dividend of Select Companies in Indian Cement Industry.

**TABLE 4. TESTING OF HYPOTHESES**

| Hypotheses | Hypothetical Relationship | Result |
|---|---|---|
| **H1 :** There is a positive impact of EPS and the determinants of dividend of Select Companies in Indian Cement Industry | Positive | Confirmed |
| **H2 :** There is a negative impact of DPS and the determinants of dividend of Select Companies in Indian Cement Industry | Positive | Confirmed |
| **H3 :** There is a positive impact of AGE and the determinants of dividend of Select Companies in Indian Cement Industry | Positive | Confirmed |
| **H4 :** There is a positive impact of SIZE and the determinants of dividend of Select Companies in Indian Cement Industry | Positive | Confirmed |
| **H5 :** There is a positive impact of GROW and the determinants of dividend of Select Companies in Indian Cement Industry | Positive | Confirmed |
| **H6 :** There is a positive impact of TANG the determinants of dividend of Select Companies in Indian Cement Industry | Negative | Not Confirmed |
| **H7 :** There is a positive impact of DER and the determinants of dividend of Select Companies in Indian Cement Industry | Positive | Confirmed |
| **H8 :** There is a positive impact of OPR and the determinants of dividend of Select Companies in Indian Cement Industry | Positive | Confirmed |
| **H9 :** There is a positive impact of NPR and the determinants of dividend of Select Companies in Indian Cement Industry | Positive | Confirmed |
| **H10 :** There is a positive impact of NPNW and the determinants of dividend of Select Companies in Indian Cement Industry | Positive | Confirmed |
| **H11 :** There is a positive impact of DPR and the determinants of dividend of Select Companies in Indian Cement Industry | Negative | Not Confirmed |
| **H12 :** There is a positive impact of OCR and the determinants of dividend of Select Companies in Indian Cement Industry | Positive | Confirmed |

**Chi-square =12163.6, Degrees of freedom = 78, Probability level = .000**

## DISCUSSION OF THE RESULT

From the path diagram, all the measured variables with latent variable of successful operation of determining the dividend policy of the select companies have positive

relationship and also significant at 1 percent and 5 percent level except TANG and DPR. These two variables have negative relationship with the determinants of dividend policy of select companies in cement industry.

**TABLE 5. DETERMINANTS OF DIVIDEND POLICY**

**REGRESSION WEIGHTS -LISREL MAXIMIM LIKELIHOOD ESTIMATES**

| Latent Variable | | Measured Variables | Estimates | SE | $R^2$ | CR | P |
|---|---|---|---|---|---|---|---|
| F1(ED) | <--- | EPS | 6.599 | 5.419 | .99 | 5.419 | *** |
| F1(ED) | <--- | DPS | 1.241 | 6.047 | 1.00 | 6.047 | *** |
| F2(CD) | <--- | AGE | 2.524 | 26.795 | 1.00 | 26.795 | *** |
| F2(CD) | <--- | SIZE | .001 | 12.360 | .97 | 12.360 | *** |
| F2(CD) | <--- | GROW | .092 | 55.552 | 1.00 | 55.552 | *** |
| F2(CD) | <--- | TANG | .081 | 40.674 | .93 | 1.674 | 0.213 |
| F2(CD) | <--- | DER | 1.041 | 66.581 | .97 | 66.581 | *** |
| F3(PR) | <--- | OPR | 7.733 | 8.353 | .31 | 8.353 | *** |
| F3(PR) | <--- | NPR | .026 | 11.830 | .34 | 11.830 | *** |
| F3(PR) | <--- | NPNW | 1.633 | 9.925 | .92 | 9.925 | *** |
| F3(PR) | <--- | DPR | 97.879 | 5.746 | .12 | 2.250 | .0241 |
| F3(PR) | <--- | OCR | 249.710 | 2.250 | .92 | 5.746 | *** |

*****- Significant at 1% level**

The above table depicts that the regression coefficient of the exogenous variables. It is inferred that the critical ratio of all the manifest variables are above the table value of 2.962 and it is significant at 1 percent level except TANG and DPR. Among the selected variables ten variables are the most influenced factors to determine the dividend policy of select companies in cement industry.

**TABLE 6. MODEL FIT INDICES**

| Sl. No | Model Fit Indices | Calculated Value | Acceptable Threshold Levels |
|---|---|---|---|
| 1 | Comparative Fit Index(CFI) | 0.721 | 0-1 |
| 2 | Normed Fit Index (NFI) | 0.641 | 0-1 |
| 3 | Relative Fit Index (RFI) | 0.598 | 0-1 |
| 4 | Incremental Fit Index (IFI) | 0.591 | 0-1 |
| 5 | Parsimonious Normed Fit Index (PNFI)) | 0.611 | 0-1 |
| 6 | Parsimony Comparative Fit Index (PCFI) | 0.593 | 0-1 |
| 7 | Tucker Lewis Index (TLI) | 0.627 | 0-1 |
| 8 | Root Mean Squared Error of Approximation (RMSEA) | 0.03 | 0.05 or less would indicate a close fit of the model |

The above table indicates that the model fit indices of the variables. The entire test has the range of 0 to 1. The comparative fit index (CFI) scored 0.721, normed fit index (NFI) scored 0.641, relative fit index (RFI) scored 0.598, incremental fit index (IFI) scored 0.591, parsimonious normed fit Index (PNFI) scored 0.611, parsimony comparative fit index (PCFI) scored 0.593, Tucker Lewis index (TLI) scored 0.627, and the Root Mean Squared Error of Approximation (RMSEA) secured 0.03 that indicates a close fit of the model.

## CONCLUSION

Dividend is the portion of corporate profits paid out to stockholders. Dividend policy is influenced by various determinants of dividend. The payment of dividend is associated with profitability position of the firm and is influenced by internal and external factors. From the analysis, TANG and DPR have negative relationship with the determinants of dividend policy of select companies in cement industry. As expected, results suggest that the higher the firm's risk, the lower is its payout ratio. Firm tends to follow a compromise policy based on adhering long term constant debt equity ratio and allowing the proportion to vary in short run. Some firm try to avoid drastic change in dividend payout ratio by creating two types of dividend: regular and extra. Extra dividends are paid during a good period as a bonus thereby creating little or no disruption during not so good period. Other firms use share repurchases as a way of returning capital to stockholders. Further, for the policy makers of the Indian cement Industry, the study may prove to be valuable for re-drafting their dividend policy keeping in view the outcome of the study.

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