Advances in Economics and Business Management (AEBM)
Print ISSN: 2394-1545; Online ISSN: 2394-1553; Volume 2, Number 5; April-June, 2015 pp. 541-546

http://www.krishisanskriti.org/aebm.html

Determinants of Dividend Policy-A Study of Mining Sector PSUs in India

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Abstract—*A dividend decision of a firm is an outcome of various considerations. These considerations differ across time and industry. The present study re-examines various factors that have a bearing on the dividend decision of a firm by using two-step multivariate procedure. First, factor analysis is performed on the data to extract prominent factors from various variables and then multiple regression is conducted on such factors. Results of factor analysis indicate that firm size & pecking order hypothesis, profitability & ownership structure, liquidity ratios & leverage, and dividend signaling and stability are the major factors. Regression on these factors shows firm size & pecking order hypothesis and dividend signaling & stability to be the determinants of the dividend policy for Mining industry in India.*

Keywords: *dividend policy, factor analysis, multiple regression analysis, PSUs.*

1. INTRODUCTION

Dividend policy is the theory of core of corporate finance. It is one of the most debated topics in the finance literature and still keeps its prominent place. Many researchers have devised theories and provided empirical evidences regarding the determinants of a firm's dividend policy. The dividend policy issue however is yet unresolved. Black (1976) hinted that, "The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that don't fit together". More recently, Brealey and Myers (2005) list dividends as one of the top 10 important unresolved problems in finance.

One of the central issues of corporate finance has been the dividend decision of a firm, which has always been studied in relation to a firm's financing and investment decisions. The association amongst these two decisions has posed various questions. How much should firm pay as dividend? How does a dividend payout policy influence the valuation of firm? Does a firm's decision to distribute cash correspond to its financing and investing decision? What is the outcome of changes in the dividend policy assuming steady financing and investment decisions of firm?

This study contributes to the existing literature by examining as many as eighteen financial variables. No prior Indian study has examined as many variables in the context of dividend decision using factor analysis and regression in case of public sector undertakings of Mining Industry, in India.

2. LITERATURE REVIEW

Kasim L. Alli, A. Qayyum Khan (1993) conducted a study on the determinants of corporate dividend policy: A factorial analysis. The values of variables were obtained from COMPUSTAT as of December 1985 and used a two-step procedure that involves factor analysis and multiple regression for its analysis. Strong support is found for the transaction cost/residual theory of dividends, pecking order argument, and the role of dividends in mitigating agency problems. Strong support is also found for the role of managerial consideration in affecting the firm's payout policy; specifically, firms that maintain stable dividend policies and firms that enjoy financial flexibility pay higher dividends. The results appear to support the tax clientele argument.

Anand Manoj (2004) analyzed the result of 2001 survey of 81 CFOs bt-500 companies and her most valuable PSU's in India to find out the determinants of dividend policy decisions of the corporate India. The factor analytic methodology was used to analyze the dividend policy of corporate India. The study finds that management of corporate India believes that dividend decisions are important as they provide signaling mechanism for the future prospect of firm and thus affect its market value.

Amidu Mohammed (2007) examined whether dividend policy influences firm performance in Ghana. The analyses are performed using data derived from the financial statements of listed firms on GSE during the most recent eight-year(1997-2004) period. Ordinary least square model is used to estimate the regression equation. The results show positive relationships between return on assets, dividend policy, and growth in sales. And results also reveal negative associations with leverage.

Dimitrios L. Papadopoulos et al. (2007) investigated the present status and determinants of dividend policy of firms listed in Athens Stock exchange. The analysis is based on eight year data covering the period between (1995-2002). Regression analysis is used to find out the effect of determinants for dividend payments. The study finds that payout policy is subjected to minor changes through years; most firms distribute no special dividends, differences between dividend policy of retail firms and that of industrial firms are minor, the variables used explain only a small proportion of dividend policy's variability and cash flow is the main determinant of dividend policy.

Naceur Ben Samy, Goaied Mohamed et al (2007) conducted a study to test whether managers of Tunisian listed firms smooth their dividends or not and outline the main determinants that may drive the dividend policy of Tunisian quoted firms. They studied the dividend policy of 48 firms listed on the Tunsian stock exchange during 1996-2002 period. To find out the determinants of dividend policy, dynamic panel regressions have been performed. The results demonstrate that Tunisian firms rely on both current earnings and past dividends to fix their dividend payment. And this study also finds that neither the ownership concentration nor the financial leverage seems to have any impact on dividend policy in Tunisia. Besides, the liquidity of stock market and size negatively impacts the dividend payment.

Husam-Aldin Nizar Al-Malkawai (2008) conducted a study on determinants influencing corporate dividend decisions of publicly quoted companies in Jordan. The analysis is based on 15-year unbalanced panel data covering the period between 1989 and 2003.They estimate the determinants for a given firm to pay dividends to its shareholders through Probit specifications. The study finds that the factors affect dividend policy such as size, profitability, and age increase the likelihood to pay dividends. Financial leverage decreases the probability to pay dividends. The findings support for the agency costs hypothesis and are broadly consistent with the pecking order hypothesis.

Gupta Amitabh, Banga Charu (2010) conducted a study on the determinants of corporate dividend policy.The period of the study is seven years from January 1, 2001 to December 31 2007. Factor analysis is performed on the data to extract prominent factors from various variables and then multiple regression is conducted on such factors. Results of factor analysis indicate that leverage, liquidity, profitability, growth and ownership structure are the major factors. Regression on these factors shows leverage and liquidity to be the determinants of the dividend policy for Indian companies.

Gill Amarjit, Biger Nahum (2010) conducted a study on the determinants of dividend payout ratios evidence from united states by examining the same for the American service and manufacturing firms. Numerical and financial data were collected in year 2007 to test the hypothesis. The descriptive statistics for all the regression variables has been computed. The study finds that firms in the services industry the dividend payout ratio is the function of profit margin, sales growth and debt to equity ratio. For manufacturing firms it finds that dividend payout ratio is the function of profit margin, tax and market-to-book ratio.

Kapoor Sujata, Mishra Anil (2010) conducted a study on dividend policy determinants of Indian services sector: A Factorial Analysis. The sample period has been chosen as 2000-2008 .In this study the relationship between the variables has been explored with the aid of statistical techniques of Factor analysis. This study is to examine the various factors that influence the dividend policy decisions of firms in Services sector in India. This literature suggests that dividend payout is positively related to profits, cash flows while Capex, retained earnings, sales growth, share prices, beta, interest paid and debt equity ratio have inverse relationship.

Talat Afza, Hammad Hassan Mirza (2010) conducted a study on ownership structure and cash flows as determinants of corporate dividend policy in Pakistan. Three years data (2005-2007) of 100 companies listed at Karachi stock exchange (KSE) has been analyzed using ordinary least square (OLS) regression. The study investigated the impact of firm specific characteristics on corporate dividend behavior in emerging economy of Pakistan. The results show that managerial and individual ownership, cash flow sensitivity, size and leverage are negatively whereas, operating cash-flow and profitability are positively related to cash dividend. Managerial ownership, individual ownership, operating cash flow and size are the most significant determinants of dividend behavior whereas, leverage and cash flow sensitivity do not contribute significantly in determining the level of corporate dividend payment.

Ch. Muhammad Adil, Nousheen Zafar (2011) aims at the re-evaluation of the incremental information content of profitability and liquidity for dividend payout. The data is pertaining to the year 2005-2009. The association between dps and eps, roe, cash flow per share and size has been tested by applying regression to panel data. The analysis reveals that there is a strong relationship between dividend payout with EPS (Earnings per Share) ROE (Return on equity) CFOP (Cash flow operating) and the results for these variables are significant buthe variable size shows the results insignificant.

Talat Islam, Muhammad Aamir, et al (2012) conducted a study to find out the determinants that motivate the dividend policy among the cement industry. Data was collected from the web of state bank of Pakistan and Karachi stock exchange from 2004-2009. To analyze the determinants of selected companies (OLS) ordinary regression was applied. The study finds that PE ratio, EPS growth and sales growth are positively associated with the dividend payout while profitability and debt to equity were found to have negative association with dividend payout.

Singhania Monica,Gupta Akshay (2012) aims to find the validity of the different views on determinants of dividend policy in India and empirically prove their significance using Tobit regression model. The primary objective of the study is to understand and anlyze the determinants of dividend policy. Specially, the study focuses on and seeks to answer the question: What are the significant determinants of dividend decision as far as Nifty 50 Index companies in India are concerned? The firm-level panel data of NSE companies from 1999-2000 to 2009-2010 is taken for this purpose.The findings suggest that firm's size(market capitalization) and firm's growth and investment opportunity are significant determinants of corporate dividend policy in India. The firm's debt structure, profitability and experience are found to be not significant determinants in the Indian scenario and in this way the results do negate some theories.

Mistry S. Dharmendera (2012) conducted a study on dividend payment decision of Indian two wheelers industry. The model has been developed using data of Indian two wheelers industry for a period of 8 years from 2001-02 to 2008-2009 based on multiple linear regression consisting of one dependent variable (the dividend payout ratio)and five independent variables(profitability, liquidity, operating activities, turnover and capital market activities). The study finds that profitability and liquidity have been found favorable to boost dividend payout ratio in Indian two wheeler industry; while operating activities, turnover and capital market activities affected dividend payment decision of Indian two wheeler industry adversely.

Abdul Rehman(2012) examines the determinants of dividend payout ratio in the largest stock exchange of Pakistan i.e. Karachi Stock Exchange (KSE). The study used the data of listed companies for 1 year i.e 2009 and regression analysis is conducted to find out the effects of determinant with dividend payout ratio. Relation of debt to equity ratio, profitability, current ratio and corporate tax was found to be positive with dividend payout ratio while Operating cash flow per share and market to book value ratio has a negative relationship with dividend payout ratio. Profitability, debt to equity and market to book value ratios were found to be the significant determinants of dividend payout ratio in Pakistan.

Mehta Anupam(2012) investigates the determinants of dividend payout for all firms in the areas of real estate, energy sector, construction sector, telecommunications sector, health care and industrial sectors for the period of 2005-2009. To analyze the characteristics of firms that affect the dividend policy, first, correlations have been applied and then explanatory variables have been regressed using backward multiple linear regression. This study analyses a range of determinants of dividend policy: Profitability, Risk, Liquidity, Size and Leverage of the firm. The study provides evidence that profitability and size are the most important considerations of dividend payout decisions by UAE firms.

Ebenezer Agyemang Badu (2013) examines the determinants of dividends payout policy of listed financial institution in Ghana using fixed and random effects. Panel data (regression analysis) covering 2005-2009 from the selected companies is used for the study. The results shows statistically significant and positive relationship between Age and liquidity but saw statistically insignificant relationship between profitability, collateral and dividend payment. Therefore, the major determinants of dividend policy of financial institutions in Ghana are age of the firm, collateral and liquidity.

Boamah Kofi Baah, Richard Tawiah(2014) conducted to examine the industry sector determinants of dividend policy and its effect on share prices of companies listed on the Ghana Stock Exchange for the period 2006-2011. The model used in this study is the ordinary least square (OLS) regression model as it is a suitable tool used in getting findings. The Study uses factors such as Price Volatility, Profit After-Tax, Earning per Share, Size, and Growth in Assets, Return on Equity, and Liquidity as explanatory variables and the Dividend Payout as the dependent variable. The study reveals that the main determinants of dividend policies of companies listed on the GSE are return on equity, profit after tax and size of the company. There are however different factors that influence the dividend payout across the various sectors. Profit After-Tax happens to be a key variable that is considered by most sectors in paying their dividend. Thus Profitability is a key determinant of dividend policy of companies across the various sectors on the GSE.

3. RESEARCH OBJECTIVES AND RESEARCH METHODOLOGY

The present study is aimed to identify the factors influencing dividend payout ratio. The study re-examines various factors that have a bearing on the dividend decision of a firm by using a two-step multivariate procedure. The eighteen variables extracted from the literature are considered while framing a dividend policy. In the first step, the factor analysis was applied on the data to extract prominent factors from these eighteen variables. In the second step, the multiple regression was applied on the factors extracted. The analysis has been carried out on pooled data for 10 years from 2004 to 2013. The data has been sourced from Prowess database of Centre for Monitoring Indian Economy (CMIE).

The identification of the factors is often determined by factor loadings, the relationship of the factor with the variable is based on the signs of factor loadings. A factor is simply the correlation of an original variable with factor. As advocated by Dillion and Goldstein, variables with factor loadings greater than absolute value of 0.30 or more are considered significant and, thus, used in labelling of factors.

The Scree plot method has also been used to determine the number of factors to be retained. In scree plot method eigen values are plotted in a descending order against the number of factors. The second stage, the estimation of the relationship between the extracted factors and the dividend payout ratios was made using multiple regression analysis. Durbin Watson, statistics have been conducted to take care of the problem of autoregression. For gauging the significance of individual regression coefficient 't' test is conducted. For determining the overall significance of the estimated regression equations, F ratio has been calculated.

4. DATA ANALYSIS USING FACTOR ANALYSIS

Kaiser-Meyer-Olkin Measure of Sampling Adequacy: Table 1 shows the results of Kaiser-Meyer-Olkin(KMO) And Bartlett's Test. The KMO measure of sampling adequacy tells us whether we can reduce the variables into broad factor or not. Value of less than 0.50 indicates that factor analysis would not produce distinct and reliable factors whereas any value close to one would generally indicate that this technique of analysis would be useful with the data. The value obtained is 0.629 which ensures the sample size is robust to apply Factor Analysis.

Table1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adquacy		0.629
Bartlett's Test of Sphericity	Approx. Chi-Square	1836.511
	df	136
	Sig.	.000

The Barlett's test of Sphericity investigates whether the original correlation matrix is an identity matrix or not. The results show that Bartlett's test has a chi-square value of 1836.511 which is significant for $p<0.01$ confirming that factor analysis is appropriate.

Extraction Method: - Extraction Method used for the analysis is Principal Component Analysis. The table 2 highlights the variance exhibited by extracted factors. It shows that the first factor accounts for highest amount of variance, the second factor accounts for second highest and so on. The principal component analysis using 'varimax rotation method' of correlation matrix of the 17 variables have led to the extraction of four broad components of dividend policy of the PSUs in India. These factors accounted for 38%, 23%, 13%, and 7% of the total variance explained respectively.

Scree Plot: - The scree plot is used to determine the number of factors to retain. Factors above the elbow of the plot are retained. The procedure involves certain amounts of subjectivity if no clear elbow emerges in the curve. The Scree plot shown below shows a clear elbow at Factor 4. These four factors cumulatively accounts for about 83% of the variations in the data. Consequently, these four factors are considered for the analysis.

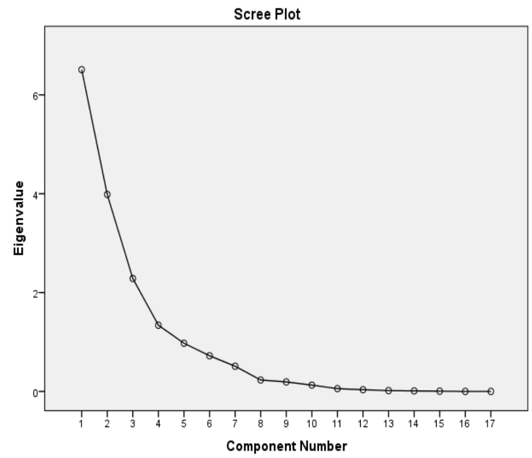

Fig. 1: The Scree plot: Determinants of Dividend in Mining industry.

Table2: Total Variance Explained

Extraction Sums of Squared Loadings		
Total	**% of Variance**	**Cumlative %**
6.137	36.098	36.098
2.793	16.431	52.530
1.896	11.153	63.683
1.803	10.609	74.291
1.240	7.294	81.586

Extraction Method: Principal Component Analysis

The factor loadings may be viewed as ordinary correlation between a variable and the factor. Underlying loadings in excess of 0.3 are significant. The Table 3 provides the factor loadings from the Principal Component Analysis (PCA) in case of "Mining Industry of PSU's in India".

Rotated Component Matrix: The results of the analysis are presented in the form of factor rotated component matrix.

5. ROTATED COMPONENT MATRIX

Table 3: Rotated Component Matrix: Mining Industry

FACTOR LABEL	Firm Size & Pecking Order Hypothes is	Profitabilit y & Ownership Structure	Liquidity Ratios & Leverage	Dividend Signalling & Stability
VARIABLES	**FACTOR 1**	**FACTOR 2**	**FACTOR 3**	**FACTOR 4**
Cash Flow	.992			
Current Earnings	.992			
Operating Cash flow	.965			
Retained Earnings	.964			
CapEx	-.925			

Size	.918			
ROE		.950		
Promoter Share holding		.933		
Non-Promoter Share holding		-.933		
Profitability		.932		
Current Ratio			.870	
Quick Ratio			.869	
Debt to Equity Ratio			-.639	
Annual Sales Growth				
Corporate tax/pbt				.924
EPS				.659
Lagged Dividend				-.593

Rotation Method**:** Varimax with Kaiser Normalization a. Rotation converged in 6 iterations

The Variables retained cash flow, current earnings, operating cash flow; retained earnings, capex, size and ROE have higher loadings on Factor 1. This factor has been name as **Factor of Pecking order hypothesis and firm size.** Dividend and investment decisions of the firm are clearly interlinked and cannot be taken in isolation. According to pecking order hypothesis, firm should prefer to finance investment by retention rather than debt. A higher retention ratio implies a lower dividend payout ratio, so lower payout ratio should be associated with lower gearing rather than higher gearing (financial risk). Conversely, a higher payout ratio should be associated with higher gearing. It has been observed that larger the firm size higher is the dividend payout of a company and hence a positive relationship between the dividend payout ratio and firm size.

Promoter shareholding, non promoter shareholding and profitability are heavily loaded in Factor 2 i.e **Profitability & Ownership Structure** .Promoter shareholding is positively loaded while non promoter shareholding is negatively loaded. The dividend payout tends to bring a decline in the stock value, thus, a conflict of interest for the insiders. A company with high insider ownership proposes for a low cash dividend payout. Profitability is also an influential determinant of dividend policy.

Variables like current ratio and quick ratio are heavily loaded on Factor 3. These ratios are proxies for firm's liquidity. Also debt equity ratio, a proxy for leverage is negatively loaded in same factor indicating that firms with higher capacity to pay the interest payment tend to maintain higher liquidity. The factor is coined as **Liquidity ratios and leverage**. Therefore, in order to increase liquidity, the firm shall lower its dividend payout. One would, therefore, expect a direct relation between liquidity and dividend payout. High interest payments (fixed charge) will result in lower dividend payment (Alli, Khan and Ramirez, 1993). Therefore, results indicate that there exists an inverse relationship between dividend rate and leverage

The variables corporate tax/pbt, EPS have significant positive loadings where as lagged dividend has negative loading on Factor 4 labeled as **Factor of dividend signaling and dividend stability**. As it is known that dividend carries a signal of firm's prosperity. Shareholders tend to welcome dividend increases and discontent dividend cuts. Thus, dividend has information content. Dividend stability exists when dividend paid during the current year is governed by previous year profits and dividend paid during the year 't-1' (Lintner 1956). Therefore, a positive relationship is expected between this factor and dividend payout ratio.

Regression Analysis: The regression results are highlighted in Tables 4, 5 and 6. Out of 5 factors 2 factors have statistically significant regression coefficients. The value of R^2 is 0 .543. This indicates that significant factors combined together explain 54% of the dividend payout pattern of Mining industry. The Durbin- Watson statistics is 1.470. Table 5 depicts F values is significant at 1% level of significance. It means the variation brought in by various factors in dividend is significant.

Table 4: Model Summary on Extracted Factors: Mining Industry

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin Watson
1	.737	.543	.519	11.96086	1.470

Table 5: Anova: Mining Industry

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	6466.331	2	3233.165	22.600	.000*
Residual	5436.362	38	143.062		
Total	11902.693	40			

Table 6: Regression Coefficients of Extracted Factors: Mining Industry

FACTOR LABEL		Regression coefficient	T	Sig.
Dividend payout ratio(Constant)	Dependent variable		17.006	.000*
Firm Size & Pecking Order Hypothesis	Factor 1	.452	4.123	.000*
Profitability & Ownership Structure	Factor 2	.149	1.376	.177
Liquidity Ratios & Leverage	Factor 3	-.099	-.901	.373
Dividend Signalling & Stability	Factor 4	-.582	-5.311	.000*

*indicates value significant at 1% level of significance.

6. CONCLUSION

Mining Industry comprises of PSU's Mining companies. The results of Factor Analysis gave four broad factors viz. Firm size & Pecking order hypothesis, Profitability & ownership structure, Liquidity Ratios & leverage and dividend signaling and dividend stability as the factors affecting dividend. These multiple regression was carried out on the factors yielded with dividend payout ratio as the dependent variable. The results of the regression show that firm size & pecking order hypothesis and dividend signaling and dividend stability are the major factors influencing the dividend. Whereas profitability & ownership structure and liquidity & leverage do not show significance input on dividend.

Major limitation of the present study is that only one industry i.e Mining and that too with small sample size, i.e 14 companies only has been taken. So the results cannot be generalized. Further research can be explored with more industries and extended sample size to relate more variables with industries.

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