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Relationship between free cash flow and dividend: Moderating role of firm size.

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Abstract

In this study we want to examine the relationship between free cash flow and dividend in presence of a moderator firm size. Results indicate proxies of free cash flow have positive and highly statistically significant relationship with free cash flow. Second model of moderator showed results insignificant with relationship between FCF and dividend. In simple regression of free cash flow and dividend, results were also insignificant which also indicate that there is no relationship in these variables. In our study we have used panel data analysis and to check the time and cross sectional effect, dummies has used. The results were highly statistically significant across the mostly companies and free cash flow but only two companies showing insignificant results. The results were insignificant across different periods. Our hypothesis was rejected under moderator but acceptable in fixed effect model.

Introduction:

Free cash flow is a Cash flow available for capital provider, which is for reinvestment, after fulfilling all the requirement of the business, such cash flow which is extra or free is free cash flow. We can also say it, cash available for resource provider (equity or debt provider). The free cash flow hypothesis implies that dividends are paid out to stockholders in order to prevent managers from building unnecessary empires in their own narrow interests. Entrenched managers have the tendency to invest free cash flow in size-increasing but non profitable projects. Stockholders would prefer to see an increase in dividend that would reduce the free cash flow available to the managers.

The value of dividend payout as a guarantee against non-value maximizing investments should be greatest for those firms with the greatest cash flow uncertainty. As a result, stock prices react favorably to announcements of dividend increases and unfavorably to dividend decreases by over investors. Jensen (1986) defines free cash flow as cash in excess of that required funding all positive net present value projects. Free cash flow tempts managers to expand the scope of operations and the size of the firm, thus increasing managers' control and personal remuneration, by investing free resources in projects that have zero or negative net present values. These unprofitable investments are an aspect of the basic conflict of interest between owners and managers. Jensen argues that some industries are particularly susceptible to the generation of free cash flow, and we posit that life insurers constitute a low-growth industry that is likely to generate such excessive cash flow.

Maintaining suitable amount of liquidity within the firms is fundamental for the smooth operations of firms. Managers have a propensity to hold large percentage of firm assets in the form of cash and cash equivalents in order to reinvest on other physical assets, payments to stockholders and to keep cash inside the firm (Almeida, Campello, & S. Weisbach, 2004). The level of cash a firm maintains is described by its policies regarding capital structure, working capital requirements, cash flow management, dividend payments, investments and asset management (C.Jensen, 2000) broadly defines free cash flow as cash flow in excess of what is required to fund positive NPV investments.

Free cash flow is a sign of agency problems because excess cash may not be returned to shareholders. (J. Brails ford & Yeoh, 2004) When firms have free cash, any acquisitions made by these firms are, by definition, negative net present value. The essence of the bird-in-the-hand theory of dividend policy is that shareholders are risk-averse and prefer to receive dividend payments rather than future capital gains. . A high retention policy may enable a company to finance a more rapid and higher rate of growth. Under a perfect market conditions, stockholders would ultimately be indifferent between returns from dividends or returns from capital gains.

Problem Statement

Managers have a tendency to hold large proportion of firm assets in the form of cash and cash equivalents in order to reinvest on other physical assets, payments to stockholders and to keep cash inside the firm (Almeida, Campello, & S. Weisbach, 2004). The problem related to free cash flow arrived when it was started getting observed that the managers do not go for the benefits of shareholders rather managers hold cash and work for their benefits and prefer the bonuses and internal projects and in turn go for negative NPV projects through the free cash flows. The study also focused commonly that in Pakistan the firms which pay low dividends have considerable cash holdings. (Afza & Adnan, 2006).

Research question:

- Whether fluctuation in free cash flow has impact on dividend?
- Whether firm size moderates the relationship of free cash flow and dividend?

Research Objectives:

- To find out impact on dividend due to fluctuation in free cash flows.
- To identify the relationship between free cash flow and dividend.
- To investigate firm size moderates the free cash flow and dividend relationship.

Importance of the study:

A number of investment and dividend studies have demonstrated that cash flow is an effective way to predict both investment and dividend. There are three primary interpretations of this relationship. The first states that a surge in company cash flow is a good indicator of an increased availability of dividend. The second interpretation argues that companies already know about potential investment opportunities, but are prevented from investing because of limited access to external sources of financing. As cash flow improves, companies are able to partake of attractive opportunities that would be otherwise unavailable. The third, known as the "free cash flow theory," asserts that managers do not behave in a manner consistent with profit maximization, as the first two interpretations suggest. Managers instead use increased cash flow to pursue objectives that have little to do with increasing profits and a great deal to do with making the managers' lives better (such as increasing the size of their company), or easier.

Literature Review

Free cash flow is a Cash flow available for resource providers after paying all expenses and requirements of business which are necessary for keeping it into operating form. In this study we actually want to find out the relationship between free cash flow and dividend taking moderating role of firm size. A lot of researcher have made research in this field and concluded that there is positive significant relationship between free cash flow and dividend because with the increase in free cash flow there is also increase comes in payment of dividend to the shareholders.

In this research (Ouma, 2012) sought to establish the relationship between dividend payout and firm performance among listed firms in the Nairobi Securities Exchange. Regression analysis was carried out to establish the relationship between dividend payout and firm performance. The findings indicated that dividend payout was a major factor affecting firm performance. Their relationship was also strong and positive. This therefore showed that dividend policy was relevant. It can be concluded, based on the findings of this research that dividend policy is relevant and that managers should devote adequate time in designing a dividend policy that will enhance firm performance and therefore shareholder value.

(Saeid Jabbarzadeh Kangarlouei, 2012) Have concluded in their study about testing research hypotheses regarding the relationship between research independent variable and dividend policy in listed firms of TSE during the period of 2006-2010 is that the variables of cash flow uncertainty and investment opportunities have linear and negative relationship and earned/contributed capital mix has linear and positive relationship with dividend policy. (Hideaki Kiyoshi Kato, (2002))The findings of this study are generally supportive of the cash flow information hypothesis. Although dividend announcements do not appear to be associated with active signaling, the announcements of dividend changes do convey information about the announcing firm's cash flow from operations. Furthermore, dividend changes are not only associated with earnings prospects in the near future but also reflect past and current earnings performance.

(ZHOU Hong, YANG Shuting and HANG Meng (2012)) explored that the relationship between company's comprehensive financial performance and free cash flows, they also explored that the performance of the company is positively correlated with firm size, while its association with debt is negative. Mohammad Ebrahimi,GhodratollahNikzadChaleshtori and Maryam Baghi (2011) examined that auditing fee for companies with low dividend-to-market value of share ratio is probable to be higher than average auditing fee for companies with high dividend-to-market value of share ratio, because if a company has low growth opportunity and high free cash flow, it will possibly invest its funds in projects with a negative net present value and management will attempt to conceal its inefficiency, resulting more serious agency problems. George Yungchih Wang (2010) concluded that free cash flows show a positive impact on performance of firm, because free cash flows might provide opportunities to generate more values.

ZHI Xiaoqiang, TONG Pan (2009) concluded that there is relationship between internal cash flow and investment expenditure, that is, the investment-cash flow sensitivity. In order to prove whether the free cash flow hypothesis or asymmetric information hypothesis has more explanatory power for investment-cash flow sensitivity. They start from the management incentive, and examine the influence of pay-performance sensitivity on the investment-cash flow sensitivity. They found that there is a certain non-linear relationship between investment-cash flow sensitivity and management pay-performance sensitivity.

Armen Hovakimian & Gayan'e Hovakimian (2009) concluded that, in years when firms have low cash flow, firms invest less which are more cash flow sensitive, on the other end in high cash flow years they invest more as compared to lees cash flow sensitive firms. They also concluded that, in years of low cash flow, managers would like to invest projects more than the firm's financial sources. They act as if marginal investment opportunities are not as low as implied by low market-to-book ratios and cash flows. The shortfall of funds for capital expenditures is covered with funds released by demanding financial slack and net working capital to abnormally low levels. In contrast, in high cash flow years, managers invest less than the financing sources permit. Instead, they accumulate excess slack and net working capital, acting as if they anticipate future shortage of funds.

Shao-Chi Chang,Sheng-Syan Chen,Ailing Hsing& Chia Wei Huang (2007) concluded that announcements of secured debt offerings are, on average, associated with significantly negative abnormal returns. They further divide their sample by firms with good and poor investment opportunities. They also concluded that announcing firms with favorable investment

opportunities have a positive response to the announcements of their secured debt offerings; on the other end firms with poor investment opportunities have a negative response to announcements of their secured debt offerings. Kissan Joseph & Vernon J. Richardson (2002) the fraction of discretionary dollars reinvested in advertising varies systematically with the level of managerial ownership.

Carolyn Carroll & John M. Griffith (2001) examined that firms having free cash flow invest in high Net Present Value projects. Those managers of the firms who have high free cash flow, and they use it to buy overpriced companies rather than paying the dividends to its shareholders, even they have low financial capacity after acquisition because they invest in low NPV projects. Stephen C. Vogt & Joseph D. Vu (2000) concluded that less pronounced over a two-year horizon and only raw and market-adjusted returns are statistically significant.

BIKKI JAGGI & FERDINAND A. GUL (1999) argument that firm's debt level will be higher when it has high FCF and low IOS. There is a positive association between FCF and debt level, especially when the growth opportunities are low. The results also show that there is a positive association between debt and FCF for low growth firms, especially when they are large. The higher debt levels for larger firms may be explained by the fact that larger firms requiring funds for growth opportunities are likely to go to the debt market rather than the equity market since debt financing would be relatively cheaper for them.

Tom Nohel & Vefa Tarhan (1998) proposed that firm's operating performance following repurchases and its determinants can be examined to determine whether or not the growth proposal of firms indeed improve as suggested by the signaling hypothesis. OWEN LAMONT (1997) concluded, based on the responses of oil company's non-oil segments, that large decreases in cash flow and collateral value decrease investment. He confirmed the findings from the literature on cash flow and investment cash matters. Samuel H. Szewczyk, George P. Tsetsekos, and Zaher Zantout (1996) concluded that the free cash flow hypothesis, which predicts a differential announcement effect that depends on the firm's level of free cash flow. Brenda P. Wells Larry A. Cox Kenneth M. Gaver (1995) concluded that mutual managers do retain significantly greater free cash flows than stock insurer managers.

Stephen C. Vogt (1994) provides evidences that free cash flow and managerial decisions over its use do have important implications for long run shareholders value. TIM OPLER and SHERIDAN TITMAN (1993) showed that cash flow increase sales growth and sales growth increase performance and strong governance affect performance and sales growth in different ways. Larry H.P. Lang, Rene M. Stulz& Ralph A. Walkling (1991) concluded that takeover announcements by firms with high cash flow which decreases their shareholders' wealth because the price paid for the target reflects synergies available only to competing bidders or, somewhat less plausibly, because the acquisition reveals negative information about bidder's management or investment opportunities.

Hypothesis:

H1: There is a significant positive relationship between free cash-flow and dividend.

H2: Firm's size moderates the relationship of free cash-flow and dividend.

Data description and Methodology:

Our database consists of annual observations of companies listed in Karachi stock exchange from 2000 to 2009. Financial statements and balance sheet analysis of state bank of Pakistan has been used in this research. In this study, the free cash flow is independent variable and the dependent variable is dividend. My basic concern is to check the relationship between free cash flow and dividend but here predicted value of free cash flow has been used. Value of free cash flow has been calculated from EBIT, change in working capital, tax rate, capital expenditure and depreciation. As well as I also want to examine the impact of firm size as moderator in relationship between fcf and dividend.

Econometric Model:

General Equation:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \mu_{it} \quad \text{(Eq-1)}$$

Formula for Free Cash Flow:

FCF=EBIT (1-Tax) + Dep ± Change in W.C- Capital Expenditure

Value of FCF has been calculated by using above formula.

$$\mathbf{FCF_{it}=\beta_0+\beta_1 EBIT_{it}+\beta_2 Tax_{it}+ \beta_3 Dep_{it}+ \beta_4 WC_{it} +\beta_5 C.E_{it} +\mu_{it}} \quad \text{(Eq-2)}$$

FCF= free cash flow

EBIT= Earning before Intrest and taxes

Tax= Tax Rate

Dep= Depreciation

WC= Working Capital

C.E= Capital Expenditure

Moderating role of firm size

Dividend= f (FCF, Firm Size, FCF*Firm Size)

$Div_{it}=\beta_0+\beta_1 FCF_{it}+\beta_2 FS_{it}+ \beta_3 (FCF*FS)_{it} +\mu_{it}$ (Eq-3)

$Div_{it}=\beta_0+\beta_1 FCF_{it}+\mu_{it}$ (Eq-4)

Div= Dividend

FCF = Free cash flow

Empirical Results:

Model 1:

Descriptive Statistics:

Descriptive statistics for the free cash flow is given in Table 1.1.These include the distribution of mean, standard deviation, minimum and maximum of the all variables EBIT, TAX, DEP, WC and CE are given in following table.

Table 1.1

	N	Minimum	Maximum	Mean	Std. Deviation
EBIT	130	-609.00	1815.90	186.9238	269.13158
TAX	130	.00	1802.90	31.2746	157.49608
DEP	130	.00	339.90	84.7085	85.40710
WC	130	-1107.50	976.80	-64.7029	273.27265
CE	130	-2813.08	1057.20	-29.9503	476.58833
FCF	130	.88	7.90	4.9805	1.41116
Valid N (list wise)	130				

Correlation Matrix

Correlation refers to any of a broad class of statistical relationships involving dependence. Correlation matrix is useful because it can indicate a predictive relationship among variables. For example an electrical utility may produce less power on a mild day based on the correlation between electricity demand and weather. However Correlation matrix is weak technique because it only considers the strength and direction of a relationship and does not explains the lead lag relationship. It only identifies that variables have no correlation, negative correlation or positive.

Tables 1.2:

		EBIT	TAX	DEP	WC	CE	FCF
EBIT	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	130					
TAX	Pearson Correlation	-.188*	1				
	Sig. (2-tailed)	.032					
	N	130	130				
DEP	Pearson Correlation	.672**	.114	1			
	Sig. (2-tailed)	.000	.196				
	N	130	130	130			
WC	Pearson Correlation	-.022	.025	-.070	1		
	Sig. (2-tailed)	.806	.782	.426			
	N	130	130	130	130		
CE	Pearson Correlation	.387**	-.502**	.016	-.258**	1	
	Sig. (2-tailed)	.000	.000	.853	.003		
	N	130	130	130	130	130	
FCF	Pearson Correlation	.430**	-.063	.559**	-.278**	-.180*	1
	Sig. (2-tailed)	.000	.474	.000	.001	.041	
	N	130	130	130	130	130	130

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Estimated linear model 1:

$FCF_{it}=\beta_0+\beta_1 EBIT_{it}+\beta_2 Tax_{it}+\beta_3 Dep_{it}+\beta_4 WC_{it}+\beta_5 C.E_{it}+\mu_{it}$

FCF =	4.065+ 0.002EBIT -0.003Tax +0.005DEP -0.002WC-0.002CE					
(t-value)	(34.53)	(3.913)	(-4.586)	(3.772)	(-6.294)	(-7.492)
(p-value)	.000	.000	.000	.000	.000	.000
R= 0.760	R^2 = 0.577		R^2adjusted = 0.560			
F = 33.845 (p-value = 0.000)		DW = 1.161			N = 130	

(Figures in the first and second parentheses, respectively, are t-statistics and p-values)

Evaluation and interpretation of the estimated linear model - 1

Model is found statistically significant (F = 33.845, p-value = 0.000) though all the explanatory variables included in the model have explained 57.7 percent variance in the dependent variable (R^2 = 0.577; $R^2_{adjusted}$ = 0.560). All variables are highly statistically significant contribution ($p < 0.01$). Results suggest that variables EBIT AND DEP positively contribute towards determination of free cash flow, and variable tax, W.C and CE does not contribute.

Model 2

Descriptive Statistics:

Descriptive statistics for the dividend is given in Table 2.1.These include the distribution of mean, standard deviation, minimum and maximum of the all variables Dividend free cash flow firm size and multiplier of FCF and FS are given in following table.

Table 2.1:

	N	Minimum	Maximum	Mean	Std. Deviation
DIV	130	.00	6.88	2.0969	2.11202
Î	130	.88	7.90	4.9805	1.41116
FS	130	5.07	9.12	7.1882	.91702
FSZ	130	5.03	66.41	36.6353	13.45990
Valid N (list wise)	130				

Correlation Matrix

Correlation refers to any of a broad class of statistical relationships involving dependence. Correlation matrix is useful because it can indicate a predictive relationship among variables. However Correlation matrix is weak technique because it only considers the strength and direction of a relationship and does not explains the lead lag relationship. It only identifies that variables have no correlation, negative correlation or positive.

Table 2.2:

		DIV	FCF	FS	FSZ
DIV	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	130			
FCF	Pearson Correlation	-.130	1		
	Sig. (2-tailed)	.140			
	N	130	130		

FS	Pearson Correlation	-.030	.650**	1	
	Sig. (2-tailed)	.734	.000		
	N	130	130	130	
FSZ	Pearson Correlation	-.118	.962**	.817**	1
	Sig. (2-tailed)	.182	.000	.000	
	N	130	130	130	130

**. Correlation is significant at the 0.01 level (2-tailed).

Estimated linear model 2:

$Div_{it}=\beta_0+\beta_1 FCF_{it}+\beta_2 FS_{it}+\beta_3 (FCF*FS)_{it}+\mu_{it}$

Div=	-3.097	+0.779FCF	+ 0.946FS	-0.150 FSZ
(T-value)	(-0.665)	(0.825)	(1.376)	(-1.148)
(p-value)	.507	.411	.171	.253
R= 0.180		R^2 = 0.032		R^2adjusted = 0.009
F = 1.400 (p-value = 0.246)		DW = 0.696		N = 130

(Figures in the first and second parentheses, respectively, are t-statistics and p-values)

Evaluation and interpretation of the estimated linear model - 2

Model is found statistically Insignificant (F = 1.400 (p-value = 0.246) though all the explanatory variables included in the model have explained 3.2 percent variance in the dependent variable (R^2 = 0.032; $R^2_{adjusted}$ = 0.009). All variables are highly statistically insignificant contribution (p > 0.01). Results suggest that variables free cash flow and firm size as moderating role do not contribute in determination of dividend.

Model 3 of FCF with dummy of company:

Coefficients

Model	Un standardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	5.438	1.381		3.937	0.000
Î	-0.330	0.118	-0.220	-2.788	0.006
DC2	4.945	0.760	0.626	6.504	0.000
DC3	1.444	0.682	0.183	2.118	0.036
DC4	2.872	0.671	0.364	4.279	0.000
DC5	2.300	0.858	0.291	2.681	0.008
DC6	5.944	0.928	0.753	6.408	0.000
DC7	3.243	0.720	0.411	4.508	0.000
DC8	4.379	0.832	0.555	5.265	0.000
DC9	0.673	0.618	0.085	1.090	0.278
DC10	1.935	0.63	0.245	3.072	0.003
DC11	6.750	0.611	0.855	11.052	0.000
DC12	4.021	0.718	0.509	5.598	0.000
DC13	3.446	0.777	0.436	4.437	0.000

Dependent Variable: Div

Estimated linear model 3:

R= 0.811	R^2 = 0.657	$R^2_{adjusted}$ = 0.619
F = 17.115 (p-value = 0.000)	DW = 1.420	N = 130

Evaluation and interpretation of the estimated linear model - 3

Model is found statistically significant (F = 17.115 (p-value = 0.000) though all the explanatory variables included in the model have explained 65.7 percent variance in the dependent variable (R^2 = 0.657; $R^2_{adjusted}$ = 0.619). FCF variable highly statistically significant contribution (p = 0.006) but shows negative relationship with dependent variable. Dummy of company 10 is insignificant while all other companies are highly positive and significant with dividend. Results suggest that all variables contribute in determination of dividend except DC 10.

Model 4 of FCF with dummy of Time:

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	1.555	.942		1.650	.102
FCF	-.044	.133	-.029	-.331	.741
DY1	1.780	.819	.254	2.173	.032
DY2	1.522	.812	.217	1.874	.063
DY3	1.240	.809	.177	1.533	.128
DY4	1.130	.805	.161	1.404	.163
DY5	1.084	.806	.155	1.345	.181
DY6	1.042	.810	.149	1.285	.201
DY7	.729	.803	.104	.908	.366
DY8	-.809	.799	-.115	-1.012	.314
DY9	-.102	.800	-.015	-.128	.899

a. Dependent Variable: DIV

Results:

R= 0.376	R^2 = 0.141	$R^2_{adjusted}$ = 0.069
F = 1.960 (p-value = 0.044)	DW = 0.666	N = 130

Evaluation and interpretation of the estimated linear model - 4

Model is found statistically significant (F = 1.960 (p-value = 0.044) though all the explanatory variables included in the model have explained 14.1 percent variance in the dependent variable (R^2 = 0.141; $R^2_{adjusted}$ = 0.069). FCF variable highly statistically insignificant contribution (p = 0.741) and shows negative relationship with dependent variable. Dummy of time DY1 and DY2 are significant while all other dummies of time are in significant with dividend. Results suggest that only two variables DY1 and DY2 contribute in determination of dividend while all others do not contribute.

Conclusion:

Our study has concluded that proxies of free cash flow have positive and highly statistically significant relationship with free cash flow. In the second econometric model of moderator, predicted free cash flow and firm size as a moderator have insignificant results which indicate that these variables do not provide active coordination in determination of dividend. The above results are relative to some previous studies because they have also indicated about the insignificant relationships of these both variables. In simple regression of free cash flow and dividend results were also insignificant which also indicate

that there is no relationship in these variable? In our study we have used thirteen companies of textile sector across the period of ten years which is indication of panel data, so for participation of each company we use dummies. The results were highly statistically significant across the mostly companies and free cash flow but only two companies showing insignificant results. The results were insignificant across different periods. Our hypothesis was rejected under moderator but acceptable in fixed effect model.

Limitations:

Our study was consisting of only a few firms and period was also insufficient due to which results are insignificant. these can be improved by increasing number of firms and by taking larger time period.

Future research:

This research can be improved by increasing number of firms and by taking larger time period. Another way is to improve research taking more independent variables or taking mediator.

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