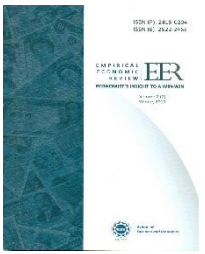

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Article: **The Relationship between Cash Flow Volatility and Dividend Payout Ratio: Evidence from Pakistan's Non-Financial Firms**

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The Relationship between Cash Flow Volatility and Dividend Payout Ratio: Evidence from Pakistan's Non-Financial Firms

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Abstract

The current study scrutinizes the impact of cash flow volatility on the behaviour of firms regarding dividend payout. It intends to explain how dividend payment is a good source of attraction for investors. A panel data set of 274 non-financial firms of Pakistan was used for analysis covering the period 2006-2018. The estimates of the Generalized Method of Moments (GMM) revealed that volatility in the cash flow of firms adversely affects their dividend payout behavior. It implies that variations in cash flow cause cash shortfall and accordingly, firms resort to cutting their dividend payment. The empirical findings of this study suggest that firms should sustain their financial health by accumulating cash in profitable times. Moreover, the managers should consider cash flow volatility in their risk management decisions.

Keywords: cash flow volatility, dividend payout, GMM
JEL Classification Codes: G29, G39, B23

Introduction

Dividend policy plays a significant role in corporate finance. It is perceived as a vital dimension of a firm's finances as far as the value of a firm is concerned. Usually, firms uphold free cash flow to pay the dividends among the shareholders which are mainly paid out of the net earnings. When the banks get levered, it may affect the disbursement of the dividends due to the deduction of interest from the net income. Thus, firms possess higher level of cash flow may pay higher dividends. However, volatility in cash flow can adversely affect the dividend payout behavior of firms. Hence, firms experiencing higher volatility in cash flow may exhibit a lower probability

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of paying dividends. Due to a volatile cash flow, managers struggle to avoid future financial distress and reduced stock prices. Instead, they prefer to shrink the dividend amount. Additionally, firms facing high volatility in cash flow also face impediments in accessing external capital markets because uncertainty upsurges the risks for investors. This environment makes these firms financially constrained and upturns their dependence on internally generated funds, which adversely affects the dividend payout behavior (Chay & Suh, 2009).[1] Usually, the higher-ups avoid high dividend payments until they are certain about their capability to maintain a stable growth pattern of their cash flow and earnings in the future. However, certain firms prefer not to reduce dividend and investment spending even with a volatile cash flow; rather, they prefer to raise funds in the external capital market instead of adjusting cash balances or increasing the non-operating cash flow (Deng et al., 2013). Still, internally generated cash flow is considered as the primary dividend payment source (Jensen, 1986). Consequently, volatility in cash flow perplexes the managers while making any decision related to paying regular dividend. More than two-thirds of dividend paying firms reported that the most critical factor affecting dividend paying decisions is the future cash flow stability (Brav et al., 2005).

The discussion above suggests that volatility or frequent fluctuations in cash flow can be detrimental or may distort the firms' dividend payout policies. Nevertheless, in the case of Pakistan, the vital relationship among cash flow and dividend payout policies of the firms has been ignored, largely. Thus, the current study strives to address this important issue with some new techniques and data. Additionally, considering cash flow volatility and its association with the firms' dividend payout policies, the contribution of this study to the existing literature in various ways. Firstly, it investigates the non-financial firms which are reportedly more sensitive to cash flow fluctuations. Secondly, it modifies and applies the Bradely et al. (1998) model to estimate the impact of cash flow volatility on dividend

[1]Financially constrained firms with an unstable cash flow pattern face an increased cost of external capital; consequently, they rely on internal cash flow and offer the lowest sum of dividends because of reduction in future cash flows.

payout. Thirdly, it deals with endogeneity through the GMM estimation technique.

Literature Review

Numerous studies have probed the matter from different dimensions. While conducting an empirical inquiry into the real estate firms, Bradley et al. (1998) confirmed the existence of an inverse link between cash flow volatility and dividend payment in different types of firms (banking industry). Osegbue et al. (2014) reached the same conclusion. Darabi et al. (2014) supported the earlier findings for the listed firms of the Tehran Stock Exchange. Additionally, Kale and Noe (1990) claimed that firms with a more stable cash flow have a higher level of internal funds. Hence, they pay an attractive amount of dividends to their shareholders. Similarly, Arko et al. (2014) observed that firms facing high risks (measured through the standard deviation of cash flow) are more likely to reduce or omit dividend payments. Interestingly, Chinese firms prefer not to curtail their dividend and investment spending by generating funds from the external capital market. Beyond the conventional approach, Rangvid et al. (2014) observed that the firms' dividend payment behavior is more predictable in countries where their cash flow and earnings are more volatile.

Firms prefer to finance their profitable projects as explored by the 'Free Cash Flow Hypothesis' and then pay dividends from the residual cash flow. Thus, the firms that follow this hypothesis cannot continue a consistent dividend policy over a long period of time, especially if they do not have sufficient funds and a stable internal cash flow. Despite the importance of this research topic, there is limited empirical knowledge available about the effects of cash flow volatility on the firms' dividend payment behavior. Prior literature did address the role of cash flow at firm level in shaping the dividend payout behaviour of the firms (Fama & French, 2001; DeAngelo et al., 2006). However, it failed to discuss the role of volatile cash flow in determining the firms' dividend policies. Easterwood et al. (2017) decomposed the total cash flow volatility into upside and downside mechanisms to check their impact on cash holdings, leverage and corporate payout. The study concluded that cash holdings negatively associated with the upside element of cash flow volatility and positively associated with downside element. An inverse relationship exists for leverage ratios.

Among these two mechanism, upside volatility is weaker than the downside volatility. At the same time, downside volatility is essential for all payout choices of the corporate policy. Tut (2019) also postulated that debt ratio has no association with dividend payout. Suppose the proportion of debt ratio is lower than the dividend yield. In this case, they have a positive association with each other. On the contrary, when the debt ratio is higher than the dividend yield, it may develops a negative association with it. Yeo (2018) suggested that dividend profit has a significant relationship with stock price volatility. Moreover, the asset turnover and cash flow volatility negatively affects the payout behaviour (Hussain et al., 2019). Al-Fasfus (2020) stated that liquidity, leverage, free cash flow and viability are significantly affects the dividend payout ratio for the Jordanian banks. There is an intensification of stock liquidity, which is the principal component of a firm's dividend. Also, the lower cash flow volatility is associated with higher dividend level (Nguyen, 2020). Rochmah and Ardianto (2020) examined the relationship among cash flow, dividend premium, and dividend payout ratio in Indonesian manufacturing companies. They observed that free cash flow and dividend premium positively associated with the dividend payout ratio, but cash flow fluctuations adversely affect dividend payment. Furthermore, they stated that companies with a stable cash flow also have a better dividend policy.

This work is an effort to enhance the understanding of the relationship between cash flow volatility and dividend payment through the analysis of the data collected from a large pool of non-financial firms in Pakistan. We incorporated the uncertainty associated with cash flow volatility with other potential control variables in the dividend model, while controlling for endogeneity in the model through the Generalized Method of Moments (GMM) estimation. It was concluded that volatility in cash flow adversely affects the dividend payment behavior of the non-financial firms of Pakistan.

Model, Data and Estimation Technique

This section explicates the theoretical framework of the study. Firstly, the specifications of the model are stated, followed by a brief description of data and the estimation technique used.

Specification of the Model

Following Bradley et al. (1998), this study examines the effect of cash flow volatility on the dividend paying behaviour of non-financial firms. The standard form of the model derived from the above mentioned study is as follows:

$$D_{i,t} = \beta_1 + \beta_2 CF_{i,t} + \beta_3 \sigma_{it} + \Sigma \beta_j X_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

where 'i' represents the firm index and 't' denotes the time period. Bradley et al. (1998) stated that dividend is influenced by the level of cash flow (CF), volatility in cash flow (σ), and a set of other financial variables (X).[2] They measured the anticipated changes in future cash flow by measuring the actual change in the existing cash flow represented by volatility. The sign of β_3 (coefficient of cash flow volatility) enables us to differentiate between the agency cost and the signalling theory of the dividend. Under the agency cost theory, β_3 was observed to be positive. This theory states that firms having a volatile cash flow experience higher agency costs because investors are less capable of predicting fluctuations in the future cash flow. Therefore, higher dividend yields are required for these firms to lessen the retention of the sub-optimal free cash flow. In contrast, the signalling theory states that managers cut dividend payments when cash flow is more volatile. In other words, this theory states that β_3 is negative. Furthermore, the inclusion of control variables in the model signifies the attempt to include all those variables that might affect the firms' dividend payout behavior. For instance, variables such as leverage, market-to-book ratio, size of the firm, return on equity, and age of the firm were included in control variables. The variable dividend payout ratio was used as a proxy for dividend payment. Accordingly, the above model can be reformulated as follows:

$$DP_{i,t} = \beta_1 + \beta_2 CF_{i,t} + \beta_3 \sigma_{it} + \beta_4 LEV_{i,t} + \beta_5 SZ_{i,t} + \beta_7 MBR_{i,t} + \beta_8 ROE_{i,t} + \beta_9 AG_{i,t} + \beta_{10} CR_{i,t} + \mu_{i,t} \ldots\ldots\ldots\ldots \quad (2)$$

In equation 2, $DP_{i,t}$ denotes the dividend payout ratio; $CF_{i,t}$ denotes the cash flow from operation; $\sigma_{i,t}$ denotes cash flow volatility; $LEV_{i,t}$ denotes

[2]We calculated the volatility of the cash flow using 3 year moving average standard deviation approach.

leverage ratio; $SZ_{i,t}$ denotes the size of firm; $MBR_{i,t}$ denotes the market-to-book ratio; $ROE_{i,t}$ denotes profitability; $AG_{i,t}$ denotes age; $CR_{i,t}$ denotes the current ratio; and $\mu_{i,t}$ denotes the corresponding error term.

Sample Selection, Data Sources and Estimation Technique

This study used the 274 non-financial firms listed in Karachi Stock Exchange of Pakistan. The selection of these non-financial firms was solely on the basis of the availability of data. The economic rationale behind the selection of non-financial firms was that the flow of internally generated funds in these firms fluctuates highly as compared to the financial firms which, in turn, intensely affects the dividend payment decision.

The sample covered a time period of 13 years from 2006 to 2018. Data was sourced from the "Balance Sheet Analysis of Joint Stock Companies" published by the State Bank of Pakistan (SBP). The correlation matrix, descriptive statistics and definitions of the variables are available in the appendix (Table 1, 2 and 3). The correlation matrix depicts that the coefficients of correlation for all the explanatory variables are less than 0.9, which indicates a low degree of association among explanatory variables. The low value of the coefficient of correlation among the explanatory variables rules out the possibility of multicollinearity.

Table 1

Correlation Matrix

Variables	Log Cash Flow	Size	Market-to-Book ratio	Leverage	Return on equity	Current ratio	Age
Log cash flow	1.00						
Size	0.82	1.00					
Market-to-book ratio	0.08	0.03	1.00				
Leverage	0.06	0.00	-0.09	1.00			
Return on equity	0.34	0.20	0.16	0.11	1.00		
Current ratio	0.04	-0.04	-0.07	0.53	0.09	1.00	
Age	-0.03	-0.03	-0.02	0.06	-0.05	-0.01	1.00

Table 2

Descriptive Statistics of Variables

Variables	Observations	Mean	Standard Deviation	Minimum	Maximum
Dividend payout ratio	2,739	0.0035548	0.0074098	0	0.8339005
Log cash flow volatility	2,462	11.39556	1.938648	3.439678	16.73392
Log cash flow	1,991	12.82431	1.821417	4.844187	17.99114
Market-to-book ratio	2,533	1.389	1.357	0.663	1.577
Size	2,740	14.93833	1.667552	8.774776	20.1323
Leverage	2,740	2.189939	1.399898	0.5273476	12.55399
Current ratio	2,473	1.59625	1.638443	0	15.36
Return on equity	2,737	11.57794	28.09531	-125.28	127.21
Age	2,740	27.08029	6.086943	11	37

The conventional approaches for the estimation of panel data such as Random Effect (RE), Fixed Effect (FE) and Pooled OLS do not tackle the problems of endogeneity and reverse causality. Although Two-stage Least Squares (2SLS) model estimates are consistent and unbiased results; however, in the presence of heteroscedasticity these estimates are no longer efficient and affect the significance of the coefficient due to biasness in error terms.[3] Besides, 2SLS is a static technique in which the lag-dependent variable cannot be used as a regressor to correct autocorrelation. A well-known econometric technique that helps to avoid the endogeneity problem, reverse causality, heteroscedasticity, and autocorrelation is the Generalized Method of Moments (GMM). The GMM is an extension of the Instrumental Variable (IV) technique. The basic robustness of the GMM approach is that the error terms of the estimated model do not need to be serially independent and homoscedastic (Arellano & Bond, 1991; Arellano & Bover, 1995). Alternatively, the estimates of GMM are consistent and efficient even in the presence of heteroskedasticity in error terms. Hence, to cope with the

[3]Due to the diversified financial nature of firms in our panel set, we suspected the problem of heteroscedasticity.

problems discussed previously, the system GMM technique was used[4]. The System GMM is a composite of two equations: one is related to the lag of instruments and the other is related to the lag difference of instruments. The system GMM is more suitable if the number of cross-section (N) is greater than the number of time series (T). In this study, the number of cross-section was two hundred and seventy-four (i.e., N=274), while the number of time series was twelve (i.e., T=13). As far as multicolinearity is concerned, we constructed the correlation matrix in the appendix (Table 3) to shows that our estimates' best property is not affected by multicolinearity. Although we found a higher correlation between cash flow and age of the firms, yet we did not omit the age because age itself is an important determinant factor of the dividend policy.

Table 3

Definitions and Constructions of the Variables

Variables	Definition	Construction
Dividend Pay-out ratio	Dividend is defined as the portion of earnings, firm is paying to its shareholders from its total income. Dividend includes cash payment, shares of stock or other property.	$DP_{it} = \frac{Total\ Dividends}{Net\ Income}$
Cash flow	It is obtained by sales plus depreciation expense, minus cost of goods sold (CGS) selling, minus general and administrative expenses (G & A), minus tax provision plus/minus the change in working capital (WC) for the period.	CF_{it} = Sale + Depreciation – CGS – G & A expense – Tax ± ΔNWC
Cash flow volatility	It is the degree of variations in operating cash flows of the firm.	$CFV_{it} = \sqrt{\frac{(CF_{it} - \overline{CF})^2}{n-1}}$

[4]We also estimated FE, RE, Pooled OLS and IVFE but we only relied on the results of GMM because the estimates of these methods are probably affected by the aforementioned econometric problems.

Variables	Definition	Construction
Market-to-Book ratio	It can be calculated by dividing the market value of equity with the book value of equity. The market value of equity is the product of outstanding shares and market price of shares. Likewise, the book value of equity is the product of outstanding shares and the book value of each share.	$MBR_{it}= \frac{Market\ value\ of\ equity}{Book\ value\ of\ equity}$
Leverage Ratio	The financial leverage ratio is a firm's total debt proportion to total assets. Basically, it represent the value of total assets levered by the debt of a firm."	$LEV_{it}= \frac{Total\ liabilities}{Total\ assets}$
Size	Size of a firm is the value of total fixed and current assets. It is given in natural log form.	SZ_{it} = LN of TA_{it}
Return on Equity	Return on equity ratio shows the profitability of a firm and the efficiency of the management in using its shareholders' funds to generate earnings. It is a primary source of fund generation. It is the ratio of net income to shareholders' equity of a firm.	$ROE_{it}= \frac{Net\ income}{Share\ holders\ Equity}$
Age	The variable age is number of years from the birth of a firm to reference period of analysis.	
Current Ratio	Current ratio is a proxy of the liquidity of a firm. It depicts the capacity of the firm to pay back the long-term and short-term liabilities. As depicted in the formula, its quantification is depicted by the ratio of the current assets of a firm to its current liability.	$Cr_{it} = \frac{Current\ Assets}{Current\ Liability}$

Results and Discussion

In order to observe the effect of cash flow volatility along with the set of control variables affecting the dividend payout behavior of the firms,

different models were estimated as shown in Table 4. However, the estimates of these models were not relied upon for the analysis with the exception of the GMM estimation results. Moreover, it is interesting to note that the coefficients of cash flow volatility appeared negative and significant in all models. It strengthens the argument that cash flow volatility (uncertainty) adversely affects the dividend payout behaviour of the firms. To draw an accurate conclusion about GMM estimates, firstly the appropriateness or adequacy of the model was checked. We applied the Arellano-Bond AR test to check the adequacy of the model. The *p*-value of the Arellano-Bond AR test is 0.165. Hence, we accepted the null hypothesis that instruments are valid. The validity of the instruments indicates that the given instruments are not correlated with error terms. Moreover, we also tested the exogeneity of the instruments through the Hansen test.[5] The *p*-value of the Hanesn test is 0.249. Hence, we accepted the null hypothesis that instruments are exogenous in nature.

To capture the dynamic effects, lag dependent variable was incorporated into the model. The lag dividend appeared positive and significant at 1%, which implies that the firms' current year dividend behaviour (data generating process) is significantly shaped by their previous year's dividend paying behaviour. In other words, a smooth dividend payment process results in a spill-over effect which permeates the upcoming periods. This finding is in line with Ahmad and Javid (2009), who elicited a positive correlation among lag dividend payment and dividend payout ratio. Similarly, cash flow is significantly and positively associated with the dividend payout ratio. The coefficient magnitude of cash flow indicates that a 1% increase in cash flow stimulates the firms' dividend payout ratio by 0.115 units. This positive association exists because free cash flow is the crucial source of dividend payment. Since firms distribute free cash flow among their shareholders in the form of dividends, cash flow increase directly affects the dividend amount. This finding is in line with Mirza and Afzal (2014), who also stated a positive correlation among dividend payout ratio and cash flow. The coefficient of the variable of interest, that is, cash

[5]Hansen test is preferable to Sargan test when robust standard error is used.

flow volatility was negative and significant at 10%. It revealed that if cash flow volatility rises by 1% then dividend payment falls by 0.078 units.

Table 4

Cash Flow Volatility and the Dividend Payout Behavior of the Firms

Explanatory Variables	(1) GMM	(2) IVFE	(3) OLS	(4) FE	(5) RE
Lag dividend payout	0.423***				
	(0.108)				
Log cash flow	0.115***	0.197*	0.167*	0.134*	0.143
	(0.040)	(0.112)	(0.097)	(0.067)	(0.106)
Log cash flow volatility	-0.078*	-0.062	-0.073*	-0.070***	-0.082*
	(0.047)	(0.108)	(0.039)	(0.020)	(0.043)
Market-to-book ratio	0.332**	0.414***	0.289*	0.289***	0.312
	(0.155)	(0.071)	(0.167)	(0.068)	(0.273)
Return on equity	0.034	0.025*	0.022	0.068***	0.028**
	(0.174)	(0.013)	(0.017)	(0.005)	(0.016)
Leverage	-0.101**	0.095	0.140***	-0.140*	-0.109
	(0.046)	(0.072)	(0.022)	(0.082)	(0.071)
Size	-0.393**	-0.203***	-0.322**	-0.315***	0.203**
	(0.183)	(0.024)	(0.142)	(0.068)	(0.093)
Current ratio	0.205**	-0.280**	0.198*	-0.268	-0.197*
	(0.081)	(0.123)	(0.114)	(0.195)	(0.176)
Age	0.037*	0.053**	0.027	-0.063**	0.079***
	(0.022)	(0.026)	(0.037)	(0.028)	(0.024)
Intercept	-0.479	0.346**	-0.297	0.225*	-0.394*
	(0.759)	(0.174)	(0.183)	(0.131)	(0.216)
No. of observations	1918	1918	1918	1918	1918
Arellano- Bond AR (2) (P-value)	0.165				
Sargan test of overid: restrictions (p-value)	0.249				

Robust standard errors in parentheses, ***, ** and * represent 1%, 5% and 10% significance level respectively

The negative sign can be explained by the fact that cash flow variations cause cash shortfall and firms manage this problem by cutting their dividend payment (Fazzari et al., 1998). Another possible reason is given by Alemeida et al. (2004), who argued that firms with a volatile cash flow face future

financial constraints. Accordingly, they respond to it by accumulating cash which negatively affects their cash dividend. A similar result was reported by (Bradley et al., 1998; Chay & Suh, 2009) in their respective studies.

Among the other control variables, the market-to-book ratio depicts a positive association with dividend payment. The results showed that a one unit increase in market-to-book ratio (investment opportunities) increases dividend payment by 0.332 units. It implies that higher investment opportunities are associated with a higher dividend to shareholder which, in turn, improves the goodwill of the firm. This finding is compatible with the signalling theory which states that "in order to attract investor, firms use dividend to signal their current and future performance." This finding is also compatible with the study of Chay and Suh (2009), who claimed that growing companies with more investment opportunities pay high dividends to their shareholders.

The coefficient associated with the leverage ratio was negative and significant. The findings suggest that one unit increase in the leverage ratio decreases the firms' dividend payout ratio by 0.101 units. The reason behind the negative association is that higher bankruptcy cost is associated with a higher level of debt. As the level of debt increases the tax-bankruptcy cost also increases, which negatively affects dividend payment. Lang et al. (1996) claimed that leverage ratio reduces the cash amount available with the firms. Therefore, due to cash shortage, firms reduce dividend payments. Some authors also found a negative correlation between the leverage and dividend payout ratios (Bradley et al., 1998; Mirza & Afzal, 2014; Malik et al., 2013). Furthermore, return on equity showed a positive but insignificant effect on dividend payment. This finding is in line with the studies of (Mirza & Afzal, 2014; Aivazian et al., 2003). They also reported an insignificant impact of return on equity on the dividend payout ratio in the case of Pakistan. The coefficient of size appeared with a negative and significant sign. The negative sign can be justified using the argument of Ahmad and Javid (2009), who stated that large-sized firms invest in their assets instead of paying dividends. They prefer to retain earnings to avoid external financing which is costly. The results illustrated that one unit increase in size decreases dividend payment by 0.393 units. Similar results were reported by (Ahmad & Javid; 2009; Mirza & Afzal, 2014).

The impact of current ratio was observed to be positive and significant at 5 % level of significance. Current ratio is considered as an essential factor for the calculation of liquidity. The coefficient suggests that a one unit increase in current ratio increases dividend payment by 0.205 units. The positive sign shows that firms with a high amount of liquid assets pay more dividends to their shareholders. The positive association between the current ratio and the payout ratio of a firm indicates that it has good liquidity, hence it will pay more dividends to maintain its goodwill and also to attract new investors. The result regarding the positive impact of liquidity on dividend payout ratio is consistent with the studies of (Ahmad & Javid, 2009; Malik et al., 2013). The age of the firms was found to be positive and significant at 10% level of significance. It indicates that with an increase in firm age of one year, the dividend increases by 0.037 units. It shows that when firms mature their growth opportunities decline which, in turn, lowers capital expenditures and increases cash flow availability (the main source of dividend payment). This finding is consistent with the study of (Al-kuwari, 2009).

Conclusion

The main objective of the current study was to examine the impact of cash flow volatility on dividend payout using firm level data of 274 non-financial firms of Pakistan. The study covered the time period 2006-2018 and employed the Generalized Method of Moments (GMM). Cash flow volatility was measured using the three year moving average standard deviation approach. The findings confirmed that cash flow volatility adversely affects the dividend payment behavior of the non-financial firms of Pakistan. For instance, it was observed that a 1% increase in cash flow volatility decreases dividend payment by 0.078 units. Alternatively, variations in cash flow cause cash shortfall, therefore, firms resort to cutting their dividend payment.

Policy Recommendations and the Way Forward

On the basis of these findings, the current study suggests the following policy recommendations. Firms should sustain financial health by accumulating cash in profitable times to circumvent any shocks to internal funds. This is because volatility in internal cash flow adversely affects both investment spending and dividend payout of the firms. In other words, firm

managers should consider cash flow volatility in their risk management decisions in order to reduce and mitigate it. Moreover, they should strengthen the sources of cash flow.

Furthermore, this study can be extended in several ways. For instance, researchers can extend the work to financial firms in order to investigate their response to cash flow volatility. Data set can also be extended and meta-analysis can be carried out to find out in-depth the patterns of cash volatility and dividend payout behaviour of the firms. Similarly, other variables such as net income margin, interest coverage ratio, and current ratio and cash flow sensitivity can be introduced into the model to further explore the issue at hand.

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