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Cash Flow Volatility and Debt Maturity Structure: Role of Macroeconomic Factors

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Abstract

This study investigated the moderating role of macroeconomic factors in the relationship between CFV and DMS by considering a sample of 380 listed non-financial firms of Pakistan over a period from (1999-2018). For empirical analysis, advanced econometric techniques have been used in this study such as ordered probit regression, two-way fixed effect, and generalized method of moments (GMM). In addition, this study analyzed the conditional effects of cash flow volatility on debt maturity structure at different levels of macroeconomic factors. The results of the study highlight that the role of macroeconomic factors weakens the CFV relationship with DMS. The results of conditional effects indicate that when inflation, money supply, and interest rate move from a low to higher level, cash flow volatility inversely affects the maturity structure of debt. However, when GDP growth moves from a low to higher level, cash flow volatility positively affects the debt maturity structure. Based on the estimated results, this study suggests the subsequent recommendations: firstly, when firms face a variation in the earning level, they may mitigate their financial distress and cost of bankruptcy by choosing short-term maturity debts. Secondly, financial managers should consider the role of macroeconomic factors in the decision-making process as it effects the firms' DMS. Finally, non-financial firms, banks, financial institutions, if face high CFV, they may reduce their risk of non-performing loans by limiting their financing.

Keywords: *Cash flow volatility, Debt maturity structure, Macroeconomic factors, Ordered probit regression, Generalized method of moment.*

JEL classification: *G30, E44, C25, C61*

1. Introduction

The term debt maturity structure (hereafter DMS) explains the relationship

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between short-term and long-term debt. Long-term debt is the debt that matures in more than one year, and short-term debt is the debt that is payable within one year (Barclay & Smith,1995). Corporate DMS has a significant effect on the sustainable development and business performance of a corporation (Modigliani & Miller, 1958; Myers & Majluf, 1984). Cash flow volatility (CFV) may lead to budget turmoil, discourage capital spending, disrupt production, or delay debt repayment. It is explained by the variation in the profits of companies, institutions and individual investors over a given period. CFV also affects the financial indicators of a company such as the debt maturity structure, capital structure, investment, and dividend policy of a firms. Macro-economic factors also affect the performance of a business. It is imperative that companies be aware of these factors in order to reduce the impact of these factors on future cash flows and profitability. Macroeconomic variables such as the unemployment rate, inflation rate, money supply, interest rate, and corporation tax rate are beyond the control of an organization. Therefore, companies are required to predict the heterogeneous effect of these macroeconomic variables on future corporate performances (Issah & Antwi, 2017; Shu, Broadstock, &Xu, 2013); Issah & Antwi, 2017). These factors bring variations in the corporate cash flows and also affect the maturity structure of debt. The main focus of this study is to analyze the moderating role of macroeconomic factors in the relationship between CFV and DMS. The study findings will be useful for financial managers in their decision-making process by considering the role of macroeconomic factors and their effects on the firms' CFV and DMS levels.

Firms in developing economies are playing an increasingly important role in the global economy. Simultaneously, firms in the developing country of Pakistan are suffering from unhealthy cash flow and liquidity problems that compound financial restraints. In comparison to developed economies, firms in Pakistan are facing constraints regarding the accessibility of different types of debts because Pakistan's banking sector and capital markets are not very developed, and interest rates are usually unstable. Hence, firms in Pakistan suffer unhealthy cash flows and liquidity problems which aggravate financial restraints (Shah & Khan, 2007; Shah & Khan, 2009). However, optimal selection of DMS may help the firms to avoid probable companies' liquidations, report agency cost issues, recognize flexibility in financing, and indicate the quality of earning. Corporate DMS is important if firm' consider flexibility in financing, cost of financing, and refunding risk (Cai, Fairchild & Guney, 2008).

Cash flow volatility (CFV) also affects the company's financial indicators, like DMS. Earlier theoretical studies explain the inverse relationship between CFV and DMS. As Signaling theory describes, in case of high CFV the more likely is that firms revise their capital structure and choose short-term maturity structure of debt in order

to reduce the bankruptcy cost of debt (Diamond, 1991; Flannery, 1986). Screening theory of DMS explains that in case of high CFV, small firms are screened out from the long-term debt market, and only large firms can borrow the long term debt because of the higher cost of financial distress (Diamond, 1991; Stiglitz & Weiss, 1981). The literature shows an inverse relationship between the candidate variables. Guedes and Opler (1996) argue that risky firms do not issue short-term debt in order to avoid inefficient liquidation, but screened out of the long-term debt market because of the view of risky asset substitution. To avoid this threat, firms select debt with shorter maturity. Minton and Schrand (1999) and Myers and Majluf (1984), view that a high level of CFV is related to high market uncertainty and a higher level of operating costs. It also increases the company's ability to access the capital market and increases the cost of doing so. Kane, Marcus, and McDonald (1985) and Sarkar (1999) explain that a high variation in a firm's cash flow raises the probability of financial distress, thus leading to a higher risk of bankruptcy. To avoid this threat, firms are more likely to choose short-term debt maturities.

Numerous studies in empirical literature have examined the inverse relationship among CFV and DMS. For example, the studies by Keefe and Yaghoubi (2016) in the context of the USA and Memon, Chen, Tauni, and Ali (2018) for China, report an inverse relationship among CFV and DMS claiming that firms with a high level of CFV are more likely to choose debt of shorter maturity in order to reduce the bankruptcy cost of debt. The same results are in line with the following studies (Amal, Svensson, &Terra, 2011; González, 2017; Keefe & Yaghoubi, 2015; Lee & Moon, 2011; Stephan, Talavera, &Tsapin, 2011; Strebulaev & Yang, 2013; Zheng, El Ghoul, Guedhami, &Kwok, 2012).

Despite the theoretical motivation regarding the relationship among CFV and DMS, empirical evidence is inconsistent and especially limited in the context of developing countries. Moreover, in the most recent literature, researchers pay attention to analyzing the relationship between macroeconomic factors and firm's DMS. An existing argument among researchers claim that firms cannot make financing decisions in isolation as both internal and external factors also have a significant impact on financing decisions. Internal factors can be controlled by the management while external factors are comprehensively referred to as macroeconomic variables which are not under the control of the firms' management. Empirically, many studies both for developed and developing economies, have investigated the influence of macroeconomic factors on DMS. Based on empirical evidence such as Awartani, Belkhir, Boubaker, and Maghyereh (2016), Keefe and Yaghoubi (2016), Memon et al. (2018), Etudaiye-Muhtar, Ahmad, and Matemilola (2017), Bokpin (2009) explain the significant relationship between macroeconomic factors and DMS. However, there is

no previous studies have investigated the effect of CFV on DMS by considering the role of macroeconomic factors. Macroeconomic factors are the most crucial factors of the economy. These factors are not under the control of firm's managements. A firm's cash flow, DMS, and profitability are affected by the heterogenous effect of these macroeconomic variables.

Despite the theoretical and empirical literature on the importance of relationship among CFV and DMS, and the role of macro factors on DMS, their interactive effect on DMS is missing from the literature. The heterogenous effect of macroeconomic factors may affect the CFV and DMS relationship. Firms needs to be aware of these factors in order to reduce their impact on future cash flows, profitability, and DMS level. Due to lack of literature in this context, there is a need to investigate whether the role of macroeconomic factors strengthens or weakens the relationship between CFV and DMS, as these factors are not under the control of firm management.

To fulfill these research gaps, this research empirically examines the moderating role of macroeconomic factors in the relationship among CFV and DMS. Macroeconomic factors are the critical factors of the economy, and it may affect the CFV relationship with DMS. Therefore, this study analyzes the effect of CFV on DMS by considering the role of macroeconomic factors in the context of the developing country, Pakistan. There is a persistent behavioral and structural heterogeneity existing among firms and several country-level differences across advanced and developing economies which have diverse economic and financial implications. The financing behavior of firms in Pakistan is also different from developed countries firms. Manufacturing firms in Pakistan highly dependent on short-term debt either because of small and undeveloped bond market or due to high-cost of long-term bank debt (Sheikh & Wang, 2011). Capital markets of Pakistan are not much developed, and interest rates are generally unstable. Consequently, firms in Pakistan experience cash flow fluctuations and liquidity problems which aggravate financial constraints (Shah & Khan, 2009). Due to the different institutional setup of manufacturing firms and capital markets, the results of this study may differ from the studies based on developed countries.

This research pays attention to the empirical literature of DMS in two important ways. First, by presenting evidence on how listed non-financial firms in Pakistan make their choices between long and short-term debt in the presence of high CFV. Second, by providing empirical evidence regarding the interactive role of macroeconomic variables in the relationship between CFV and DMS for the first time in the body of corporate finance literature. This study used a Black and Scholes (1973) model as an annotation to construct the study hypothesis. Black and Scholes (1973) model explain the direct association among CFV and the cost on debt. By using this model

this study hypothesizes that the firms with a high CFV are more likely is to issue debt of short-term maturities. The results of the study accept this hypothesis.

The study findings indicate that the role of macroeconomic factors weakens the CFV relationship with DMS. Moreover, the results show the inverse relationship among CFV and DMS. The study findings may be useful for financial managers, institutions, and individual investors if they consider high cash flow volatility and recognize the potential influence of macroeconomic factors, they may mitigate their financial distress and the cost of bankruptcy through an optimal selection of debt maturity.

The remaining section of the paper is organized as follows: Section 2 provides a detailed review of the literature. Section 3 discusses the data and methodology. Section 4 discusses the empirical results. Section 5 concludes the results of the study and suggests some policy recommendations.

2. Literature Review

This section consists of two parts. Section one explains the theoretical literature. Section two briefly describes the empirical literature. A brief review of the literature are given below.

2.1 Theoretical literature

Cash flow volatility also affects the financial indicator of a company's such as debt maturity structure, capital structure, investment, and dividend policy making. Numerous theoretical studies in literature explain an inverse relationship between CFV and DMS. Diamond (1991) and Flannery (1986) proposed the signaling theory which describes that if firms experience CFV, they are most likely to revise their capital structure and choose short term maturity of debt in order to decrease the bankruptcy cost. Additionally, screening theory describes that if firms are experiencing high CFV, small firms are screened out of the long-term debt market, and only large firms can borrow long-term debt because large firms have the ability to bear the cost of financial distress. However, in order to avoid the cost of financial distress, small firms choose short term debt (Diamond, 1991; Stiglitz & Weiss, 1981). Later on, Guedes and Opler (1996) argued that risky firms do not issue short-term debt in order to avoid ineffective liquidation, but screened out of the long-term debt market because of the view of risky asset substitution. To avoid this threat, firms select debt of shorter maturity. Minton and Schrand (1999) and Myers and Majluf (1984), view that a high level of CFV is related to high market uncertainty and higher level of operating costs. It also increases the company's ability to access the capital market and increases the

cost of doing so. In order to avoid this cost, firms select debt of short-term maturity. Moreover, Kane et al. (1985) and Sarkar (1999) explains that high variation in a firms cash flows raises the probability of financial distress, thus leading to a higher risk of bankruptcy, to avoid this threat, the more likelihood is that firms choose short-term debt maturities.

This study used the firm-specific determinants, such as leverage, profitability , firm size, tangibility, liquidity, growth opportunities, and corporate tax for the control variables of the model. Different theories in literature explains the relationship among firm-specific determinants and DMS. Leverage may be positively related to DMS or may be negatively related to DMS as literature provided the contradictory arguments. According to liquidity risk hypothesis, leverage has a direct relationship with DMS. The liquidity risk hypothesis predicts that firms DMS increases as leverage increases in order to offset the high probability of liquidity crisis, thus, delay exposure to bankruptcy risk (Diamond, 1991; Flannery, 1986). Morris (1992) claims that long-term debt may help the firms to postpone the exposure to bankruptcy risk. Therefore, high leverage firms tends to use long-term debt. Stohs and Mauer (1996) indicate that a large proportion of long-term debt certainly produces a higher value for average debt maturity. Leland and Toft (1996) conclude that leverage level depends on debt maturity, and firms with lower leverage level tends to choose short-term debt. In contrast, Dennis, Nandy, and Sharpe (2000) show that the leverage is inversely related to DMS. They argue that this happens because agency costs of underinvestment may be limited by reducing the leverage and shortening the DMS. This result supports the agency cost of underinvestment which emphasizes the role of short-term debt for reducing agency problems, such as under-investment and assets substitution (Brounen, De Jong, &Koedijk, 2004; Myers, 1977).

Additionally, according to tax hypothesis, profitability is likely to be positively related to DMS, because profitable firms have higher taxable income, thus, receive greater tax benefits from long-term debt. Taxability can influence on firm's DMS because choosing long-term debt over short-term debt may create a tax timing option to repurchase and re-issue debt (Brounen et al., 2004; Myers, 1977). Further, theoretical literature explains a direct relationship between CFV and DMS. Signaling hypothesis states that larger firms have lower asymmetric information and higher tangible assets relative to future investment opportunities, therefore, easier access to long-term debt markets (Myers, 1977). According to agency cost hypothesis, agency problems between shareholders and lenders, such as risk shifting and claim dilution, may be particularly severe for small firms. As a result, bondholders attempt to control the risk of lending to small firms by limiting the length of debt maturity (Flannery, 1986). Furthermore, according to the maturity matching principle, Myers (1977), tangibility is expected

to be positively related to DMS. Firms with a high ratio of fixed assets to total assets should have greater borrowing capacity, because it is easier for these firms to match the maturity of borrowing with the maturity of their assets. Hence, firms use more long term debt with greater asset tangibility (Barclay & Smith 1995; Maksimovic & Demirguc, 1996). Liquidity is likely to be negatively related to DMS. The reason is that firms with higher business risk more likely is to face higher agency costs, and thus, they have an incentive to shorten the debt maturity in order to decrease the agency cost (Kane et al., 1985). Growth opportunities may be positively or negatively related to DMS. According to underinvestment theory, if growth opportunities are higher, a firm should choose more short-term debt (Myers, 1977). According to overinvestment theory, long-term debt may help to control the overinvestment behavior of management, which means that the sign of growth opportunities should be positive (Hart & Moore, 1994). According to tax theory, Kane et al. (1985) the tax shield advantage is inversely related to DMS. The reason is that optimal debt maturity structure is determined by a trade-off that exists between three factors, flotation costs, bankruptcy costs and the benefits of tax shields. Further, tax theory explains that with the benefits of tax shield, the maturity of debt decreases while increases with flotation costs. Overall, theories explain that firm-specific determinants have a significant impact on firms' DMS selection.

2.2. Empirical literature

2.2.1. Cash flow volatility and debt maturity structure

The existing empirical literature about the influence of CFV on DMS is inconclusive. Three types of empirical literature exist in this context. First type of literature explains the negative relationship between CFV and DMS. Second type of literature describes the positive relationship between CFV and DMS. Third strand of literature show an insignificant relationship between CFV and DMS.

Following studies highlight an inverse relationship between CFV and DMS such as Ozkan (2000) investigated the said relationship for united kingdom, Antoniou, Guney, and Paudyal (2006) for France, Germany, and UK, Deesomsak, Paudyal, and Pescetto (2009) for Asia Pacific Region, Amal et al. (2011) for USA, Stephan et al. (2011) for Ukrainian, Zheng et al. (2012) for North America. Their results confirm that high volatile firms may issue less long-term debts in order to ignore any long-term commitments. González (2017) report the similar findings for 35 developed countries by claiming that firms with a high CFV may change their DMS more frequently in order to decrease the bankruptcy cost.

Keefe and Yaghoubi (2016) in the context of USA, and Memon et al. (2018)

for Chinese listed firms empirically investigated the influences of CFV on zero debt by maturity. These studies explained the non-linear connection of proportional variables and their findings indicate that firms with a high CFV, are more likely to choose short-term maturity debts (or zero debt by maturity). Lee and Moon (2011) and Strebulaev and Yang (2013) for USA found that high cash flow volatile firms are more likely to follow a zero debt policy. However, Dang (2011) for UK firms, report an insignificant relationship between CFV and zero debt policy.

The second strand of the literature describe a positive relationship between CFV and DMS. Antoniou et al. (2006) found a positive relationship between CFV and DMS for French firms, by claiming that in order to ignore the possible liquidation, firms with a high CFV may issue long-term debts. The same results were found by Amal et al. (2011) for Latin America, Lemma and Negash (2012) for African firms. Their results referring to the fact that riskier borrowers may not be able to bear the cost of rolling short-term debt, as a result, they choose long-term debts. Whereas, low risky borrowers switch to short-term debts (Flannery, 1986).

Third strand of literature insignificant relationship found among CFV and DMS such as, Elyasiani, Guo, and Tang (2002) for USA, Körner (2007) for Czech and Cai, Fairchild, and Guney (2008) for Chinese companies, Hajiha and Akhlaghi (2013) for Iran, Tayem (2018) for Jordon. However, the empirical literature on the relationship between CFV and DMS is limited for developing countries.

2.2.2 Role of macroeconomic factors and debt maturity structure

The impact of macroeconomic factors on DMS has been investiaged widely in empirical literature. The most important macroeconomic indicator is GDP growth. Awartani et al., (2016), Bokpin (2009), Hajiha and Akhlaghi (2013), Piao and Feng (2013), Turk (2016) found a GDP positive relationship with DMS stated that firms in higher economic growth countries borrow less short-term debts and use more long-term debts. However, Etudaiye-Muhtar et al. (2017) inverse relationship found between GDP and DMS for African country, and claimed that when GDP growth rate is high, the economic condition is better, and firms face more investment opportunities, but banks still offer short-term debts in order to avoid risk. Hence, the corporate DMS is the short-term debts.

Inflation rate is an important factor in DMS selection. Studies from Awartani et al. (2016); Etudaiye-Muhtar et al. (2017); Keefe and Yaghoubi (2016); Memon et al. (2018) depicts an inflation inverse relationship with DMS, and explains that at higher inflation rate, creditors less willing to borrow long term debt due to the fear of bigger loss of loaned capital value in an inflationary environment. Therefore,

the usage of short-term loans may decrease the uncertainty of the real value of debt returns. Likewise, Mokhova and Zinecker (2014); Wang and You (2012) show an inverse relationship between money supply and DMS, claiming that as money supply increases in the economy firms have more investment opportunities based on agency cost theory, thus, they choose short-term debt in order to decrease the agency cost because of underinvestment or overinvestment hypothesis.

Another important macroeconomic variable used in the literature is interest rate. When country interest rate changes it also affects the DMS level of a firms. Bokpin (2009) and Rehman (2016) show that interest rate is positively related to DMS, because when interest rate increases, it offers more tax savings to firms. Hence, firms choose long-term debt maturities.

2.2.3. Firm-specific determinants and debt maturity structure

Many studies in the empirical literature have investigated the impact of firm-specific determinants on DMS. Like Antoniou et al. (2006) investigated the determinants of DMS for France,Germany, and British firms. The results show that leverage is directly related to DMS for France firms, but inversely related for Germany and British firms. Liquidity is inversely related to DMS for all three countries. Firm size is directly related to DMS in all three country's sample size firms. Shah and Khan (2009) analyzed the determinants of DMS in the context of Pakistan by using a sample of non-financial firms. Their results show that growth opportunities, tax rate, and firm size are the significant determinants of DMS. Firm size is positively related to DMS. Tax rate is inversely related to DMS. However, growth insignificant relationship found with DMS. Gul, Sajid, Mumtaz, and Murtaza (2012) investigated the determinants of DMS by using a sample of 23 Pakistani commercial banks listed at the Karachi Stock Exchange (KSE). Their results show that long- term debt decreases with the increase in company size and corporate tax rate. However, leverage is positively related to DMS. Further, Khan, Khan, and Khan (2015) examined the determinants of DMS for the non-financial firms of Pakistan. Their findings indicate that growth, firm size, and leverage positively related to DMS, while liquidity inversely related to DMS. Katper, Madun, Syed, and Tunio (2017) empirically analyzed the impact of firm-specific determinants on the DMS of conventional and Shariah firms for Pakistan. The study findings show that Shariah compliance entails some firm-specific characteristics such as lower debt ratio, lower liquidity, and higher tangibility. Further, results highlight that the DMS of Shariah and conventional firms differ significantly, and DMS among Shariah firms are significantly shorter than conventional firms.

Overall, from the review of empirical literature, researcher noticed that the moderating role of macroeconomic factors in the relationship between CFV and DMS is

missing. Additionally, relationship between CFV and DMS is limited for developing economies. There have been no studies conducted in the context of Pakistan that specifically investigate the CFV and macroeconomic factors relationship with DMS. The moderating role of macroeconomic factors in the relationship among CFV and DMS is also missing in the literature. Therefore, to fulfill these gaps, this research takes a lead and investigates the impact of CFV on DMS in the context of a developing country, Pakistan. Secondly, this research investigates the influence of CFV and DMS by incorporating the role of macroeconomic factors. Macroeconomic factors are the crucial factors of the economy and also affects each sector of the economy. The financial indicators of a firms also affected by the changes in macroeconomic factors. Therefore, by considering the importance of macroeconomic factors, this study investigates the moderating role of macroeconomic factors in the relationship between CFV and DMS. Hence, this research will contribute to the existing empirical literature of Pakistan by providing evidence and will offer an evocative insight in relation to their influence on firms financing decisions.

3. Data and Methodology

This section explains the data set and hypothesis development in the frame-work of theoretical model.

3.1. Data sources

This study examines an unbalanced panel data set of 380 listed non-financial firms of Pakistan from 1999-2018.The sample consist of overall sectors of listed non-financial firms (sector list is attached, see appendix Table A3). The selected non-financial firms balance sheets extracted from the published source of State Bank of Pakistan (SBP). This study used a convenient sampling technique to select the sample size. Additionally, this study included firms that meet the following criteria (i) the firms has to be listed in the Karachi Stock Exchange (KSE) during the sample period from 1998-2018 (ii) availability of complete information on all firm-specific variables of the study. Data concerning to the selected macroeconomic variables such as inflation, GDP growth, interest rate data extracted from the source of world development indicator (WDI), and money supply (M2) data has been extracted from the various issues of economic survey of Pakistan.

3.1.1 Variables construction

This section explains the construction of variables used in this study. To determine the CFV relationship with DMS, variables are constructed in the following ways: DMS is the dependent variable of all models. The DMS1 is determined by using a novel

methodology and made categories depends on the firm's debt selection at different maturity levels followed by (Keefe & Yaghoubi, 2016; Memon et al., 2018), but making with some amendments for the construction of DMS categories.

Table 1: Construction of DMS Categories

DMS	Debentures & long-term notes payable	Total long- term debt	Total short- term debt
i	No	No	No
ii	No	No	Yes
iii	No	Yes	May be
iv	Yes	Yes	May be

Note: Table 1. displays the DMS variable construction. Column one explains the DMS variable categories. "Yes" states that firm's is using that kind of asset. Whereas, "No" indicate that firm's is not choosing that specific debt type. "Maybe" meaning is firm's may or may not be choosing that type of debt.

Table 1. shows the construction of DMS. Category 1 is set as if firms do not choose any type of debt. Category 2 is set as if firms choose debt of short-term maturity. Category 3 is assigned as if firm's choose debt of long-term maturity, but do not choose any debentures or long-term notes payable. Category 4, is set as if firms choose debentures or long-term notes payable. In summary, when the categorical variable moves from 1 to 4, firms DMS increases. Due to the unavailability of DMS data this study considers the current liabilities as short-term debts (maturity less than one year), non-current liabilities as long-term debt (greater than one year) excluding debentures and note-payables. In the fourth category, added the non-current liabilities, debentures, and note payables. Various studies in the empirical literature used different proxies to measure the DMS. Therefore, this study adopted the alternative measure DMS2 followed by Demirgüç-Kunt and Maksimovic (1999) and constructed DMS2 by taking the ratio of long-term debt (LTD) to total debt (TD).

To test the hypothesis, this study adopted the following explanatory and utmost reliable firm-specific control variables.

3.2. Methodology

3.2.1 Theoretical framework

This section provides a significant contribution to the development of key research hypothesis of the study. This study used a Black and Scholes (1973) model as an annotation to construct the study hypothesis.

Black and Scholes Model

Table 2: Explanatory and Control Variables

Variables	Measurement	Expected sign		Theory
		Dependent Variable DMS1	Dependent Variable DMS2	
CFV	Standard deviation of earnings before interest, taxes, and depreciation (EBITD) scaled by firm's total asset as a proxy for CFV using ten years window followed by (Friend and Lang, 1988; Dierker et al. 2013).	-ve	-ve	Screening and Signaling theory
Control variables				
Leverage (LEV)	Firm's total debt to total assets (Cai et al., 2008; Gul et al., 2012).	-ve	-ve	Agency cost of Underinvestment problem
Return on Assets (ROA)	EBITD as % of total assets (Mateus & Terra, 2013; Qiuyan, Qian, &Jingjing, 2012)	+	+	Tax hypothesis
Firms Size (SIZE)	Natural logarithm of local sales (Huang & Song, 2006; Lemma & Negash, 2013).	+ve	+ve	Agency cost hypothesis & signaling hypothesis
Tangibility (TANG)	Fixed assets to total assets (Fan, Titman, & Twite, 2012; Keefe & Yaghoubi, 2016; Memon et al., 2018).	+/-	+/-	maturity matching principle
Liquidity (LIQ)	Current assets to current liabilities (Cai et al., 2008; Deesomsak et al., 2009).	-ve	-ve	Agency cost Hypothesis
Growth Opportunities (GROWTH)	Percentage change in total assets (Heyman, Deloof, & Ooghe, 2008; Orman & Köksal, 2017).	+/-	+/-	underinvestment or overinvestment hypothesis
Tax Rate (TAX)	Firms tax expense to pre-tax profit (Cai et al., 2008; Gul et al., 2012).	+/-	+/-	Tax Hypothesis
Macroeconomic Variables				
Inflation (INF)	Inflation, CPI (annual %) (Keefe & Yaghoubi, 2016; Memon et al., 2018).	-ve	-ve	-

GDP growth (GDPG)	GDP Growth (annual %) (Etudaiye-Muhtar et al., 2017; Keefe & Yaghoubi, 2016)	+/-	+/-	Underinvestment/over-investment hypothesis
Money Supply (MS)	Money Supply (M2) (Hajiha, Akhlagi, & Rasaiian, 2014; Mokhova & Zinecker, 2014).	-ve	-ve	Agency Cost Hypothesis
Interest Rate (INTEREST)	Lending interest rate (%) (Antoniou, Guney, & Paudyal, 2008; Bokpin, 2009)	+/-	+/-	Tax Hypothesis

Black and Scholes (1973) model explain the direct relationship between CFV and the cost of debt. This model set the European call option price as

$$Call_{BS}(V_t,\ \beta,\ r,\ T-t,\ \delta) = V_t N(d_1) - \beta e^{-r(T-t)} N(d_2) \tag{1}$$

Where V_(t)is the primary assets value, β is the strike price, r is the annual risk-free rate, T-t is the time in years to the expiration date, and δ is the standard deviation of the return of the asset, and

$$d_1 = \frac{[\ln\left(\frac{V_t}{B}\right) + \left(r + \frac{\delta}{2}\right)(T-t)]}{\sqrt{\delta + (T-t)}} \tag{2}$$

And

$$d_2 = d_1 - \sqrt{\delta(T-t)} \tag{3}$$

Where N(d) is the cumulative standard Normal distribution. Stoll (1969) explains the relationship between european call and put options with the same strike price and ending date as

$$Put_{BS}(V_t, \beta, r, T-t, \delta) = \beta e^{-r(T-t)} Call_{\beta S}(V_t, \beta, r, T-t, \delta) \tag{4}$$

Equation (4) shows the put-call parity relationship. Equations (1) and (4) indicate that prices of call option and put option raises with volatility δ. Further, used the option pricing model to set the price of debts and equity extensively. Merton (1974) set a model to price the firm's debt and equity. In the model Merton's, equity holders possess the firm V_t and acquire debt at t = 0 from creditors with face value β mature at T because of debt constraints if firms defaulting at T when $\beta \geq V_t$, the creditors get V_t. If not, the creditors collect . Hence, the ambiguous payoff to the creditors is

$$D(V_t, T) = min(V_t,\ \beta) \tag{5}$$

By using the formula of Black and Scholes (1973)and Merton (1974) set the value of firm as

$$\text{Firm Value} = Call_{BS}\left(V_t,\beta,r,T-t,\delta\right)+\beta e^{-r(T-t)}-Put_{BS}\left(V_t,\beta,r,T-t,\delta\right) \quad (6)$$

Where the value of equity is set as

$$E\ (V_t,T)=Call_{BS}\left(V_t,\beta,r,T-t,\delta\right) \quad (7)$$

And the value of debt is set as

$$DV_t,T=\beta e^{-r(T-t)}-Put_{BS}\left(V_t,\beta,r,T-t,\delta\right) \quad (8)$$

The equation (7) explains that the levered firm value of equity is equal to the borrowed firms call options on the assets. However, Equation (8) explains that debt value is equivalent to the risk-free debt price subtract from the price of the put option indicate that as CFV rises, the price of call and puts options lowers the debt price. In equation (7) high CFV raises the equity value. However, it drops the debt value in equation (8) as a result raises the marginal cost of debt.

Hence, the cost of debt is

$$R_D=\frac{\beta}{\mathrm{D}\left(V_t,T\right)}-1 \quad (9)$$

As δ increases, it declines $D(V_t,T)$ and also increases R_D. Consequently, high CFV has a relatively higher cost of deb, indicates the following hypothesis that

H1: Firms with high (low) CFV more likely is to issue the debt of short (long) term maturities.

The Black and Scholes(1973) model suggest that the cost of debt is directly related to DMS. 1st term of equation (8) risk-free debt declines with maturity time T, and second term$Put_{\beta S}$ rises with maturity time T. Therefore, debt value $DV_t,T)$ falls with maturity. As a result, equation (9) shows that cost of debt rises with time to maturity. Therefore, hypothesize that the firms with a high CFV more probability is to issue the debt of short-term maturities.

3.2.2 Empirical models

This study used the two advanced econometric techniques (ordered probit regression and dynamic panel model) in such a way that each technique captures distinct aspects. Firstly, to empirically examines the impact of CFV on the DMS of a firms ordered probit regression model has been used followed by Memon et al. (2018) and Keefe and Yaghoubi (2016).

$$\Pr\left(DMS1_{it}\ >m|c,Z_{it},v_j\right)=\varphi\ \left(\beta CFV_{it}\ +Z_{it}\delta'+v_j-c_m\right) \quad (10)$$

Where dependent variable is DMS1, ordered categorical variable. m indicates

the number of categories, here four categories of DMS1 variable are selected, that is, m=4, c indicates the cut points set, thus, in this model the cut points are c = 3, Z_t is the matrix of control variables such as leverage, return on assets, firm size, tangibility, liquidity, growth opportunities, and corporate tax rate, V_j is the error term follows the standard normal distribution N(0,1). ϕ is the commutative distribution function of the standard normal distribution, CFV_t cash flow volatility is the explanatory variable of ith firms in time period t. β is the slope coefficients. δ' is the K x 1, where K is the number of control variables.

In addition, to empirically examines the interactive role of macroeconomic factors for the effect of CFV on DMS1 following equation has been applied:

$$\Pr(DMS1_{it} > m|c, Z_{it}, v_j) = \varnothing\left(\alpha CFV_{it} + \beta MAC_t + \gamma\left(CFV_{it}^{*} MAC_t\right) + Z_{it}\delta' + v_j - c_m\right) \quad (11)$$

MAC_t is the macroeconomic variable. This study uses the four macroeconomic variables separately not in the form of index such as inflation, GDP growth, money supply, and interest rate in period t. CFV_{it} is the cash flow volatility of ith firms in t period. CFV_{it}* MAC_t is the CFV interaction term with macro variables in period t. The interaction term CFV_{it}* MAC_t, used in this study because researcher is interested in examine, whether any changes in monetary policy (changes in money supply or interest rate) or fiscal policy (changes in GDP growth) or changes in other macroeconomic variables during the sample period affects the CFV and DMS relationship or not. In other words, this study main focus is to analyze whether the role macro factors strengthen or weakens the CFV and DMS relationship. Macroeconomic factors are the key drivers of the economy like, any changes in the monetary or fiscal policy also affects the financial indicators of the firms. Therefore, the main aim of this research is to investigate the relationship between CFV and DMS by explicitly incorporating the role of macroeconomic factors. α,β, γ, δ' are the slope coefficients. ϕ shows the cummulative standard normal distribution.

3.2.3. Dynamic panel model

To examine the impact of CFV on DMS2 this study used the following dynamic panel econometric model followed by Dang (2011) and Fan et al. (2012) .

$$DMS2_{it} = \beta_0 + \beta_1 DMS2_{it-1} + \beta_2 CFV_{it} + \beta_3' Z_{it} + \tau_i + \omega_t + \varepsilon_{it} \quad (12)$$

The dynamic panel regression model is estimated by using another proxy DMS2, as the dependent variable is the ratio of long-term debt to total debt and it is restricted between zero and one. Firm-level heterogeneity is possibly to be important for DMS. Where subscript i refers to firm-specific and t refers to the time period. The symbols τ_i are firm-specific effect, ω_t time-specific effect and ε_{it} shows the error term which

is supposed to be identically and independently distributed with N (0,1). This study selects the fixed effect model based on the Hausman test value. Hence, fixed effect results are best in our study. In order to address the problem of firm-specific effects and endogeneity in panel settings, this study used the dynamic panel regression equation by using lagged values as instruments. The dynamic panel regression model is estimated through two-way fixed effect, difference, and system GMM.

To analyze the interactive effect of CFV and macroeconomic factors on DMS, following equation has been used in dynamic form.

$$DMS2_{it} = \gamma_0 + \gamma_1 DMS2_{it-1} + \gamma_2 CFV_{it} + \gamma_3 MAC_t + \gamma_4 CFV_{it}{}^{*} MAC_t + \gamma_5{}' Z_{it} + \tau_i + \omega_t + \varepsilon_{it} \quad (13)$$

Where, $DMS2_{it-1}$ is the lag of the dependent variable.

3.3. Estimation methods

To estimate the impact of CFV on DMS1, this study utilizes an ordered probit regression econometric technique. Various studies in the literature suggest that the ordinary least square regression is not appropriate especially when the dependent variable of the model is based on categories. In this case, the suitable model is ordered probit (Greene, 2003). An ordered probit is a generalized form of extensively used probit analysis in the case of more than two ordinal outcomes of the dependent variable. The ordered probit model estimates the relationship between ordinal variable and a set of explanatory variables. In this study, the main model is estimated by ordered probit regression followed by (Keefe & Yaghoubi, 2016; Memon et al., 2018). In this model dependent variable is ordinal variable and a set of explanatory variables. Therefore, employs an ordered probit model. It follows the cumulative standard normal distribution.

Additionally, to control the firm heterogeneity and time-invariant, apply a dynamic panel model. Dynamic panel model handles the issue of endogeneity and robustness. Dynamic model is estimated with fixed effect, system (Blundell & Bond, 1998), and difference(Arellano & Bover, 1995) generalized method of moment (GMM). In order to determine which model is suitable fixed or random effect, perform the Hausman test. In addition, to check the instruments validity Hansen- J test has been used, underlying the null hypothesis of "Instruments are valid", and the hypothesis of no serial correlation exist in the error term, AR(1) and AR(2) tests have been used for first and second-order serial correlation, asymptotically distributed as N(0,1) with the Ho of no (1st and 2nd order serial correlation), correspondingly.

4. Results and Discussion

This section discusses the CFV relationship with DMS1 as well as explains the role

of macroeconomic factors in the relationship among CFV and DMS1. Additionally, the same relationship describes these results with alternative proxy DMS2.

4.1. Empirical analysis

The table of descriptive statistics and pairwise correlation given in Appendix A1, from the summary statistics, it can be noted that over the period of 1999-2018 the mean value of CFV is approximately 1.37 and standard deviation is 43.61. Due to variations in the firms level data series, this study normalized the data through minimization and maximization method. Therefore, all of the firm-specific variables minimum value is near to zero and maximum value closer to 100. DMS2 has the mean value is 29.89. The average of other firm-specific variables, leverage (0.1525), return on assets (7.443), firm size (65.09), liquidity (0.226), tangibility (0.173), growth opportunities (0.132), and tax rate (27.78). In addition, the table results report that the average of macroeconomic factors such as inflation average is (7.435), GDP growth (4.383), money supply (13.29), interest rate (11.19). All of the candidate variables series follows a symmetric distribution.

The pairwise correlation report the results of correlation coefficients among explanatory variables. CFV measure is inversely related to firm size, liquidity, growth opportunities, and corporate tax rate, while positively related to tangibility, leverage, and return on assets. Additionally, CFV measure is directly related to macro variables such as GDPG, and money supply, but inversely related to inflation and interest rate.

In order to test the effect of CFV on DMS1, and to analyze the role of macro factors in the relationship betweeb CFV and DMS1, results of ordered probit regression[4] are given in the table 3.

4 Authors also estimated the marginal effects relative to each DMS base category, results can be provided as per applicability.

Table 3: Cash Flow Volatility and Debt Maturity Structure: Role of Macroeconomic Variables

Variables	(1) Baseline	(2) INF	(3) GDPG	(4) MS	(5) INTEREST
CFV	-0.0007*** (0.000)	-0.0004*** (0.000)	-0.0003*** (0.000)	0.0001 (0.914)	-0.0015*** (0.000)
Mac	-	-0.2740*** (0.000)	-0.0668*** (0.000)	-0.0767*** (0.000)	0.0455*** (0.004)
Mac*CFV	-	-0.0083*** (0.000)	-0.0001*** (0.002)	-0.0053*** (0.000)	0.0096** (0.029)

ROA	-0.4661*** (0.002)	-0.4393*** (0.004)	-0.4658*** (0.002)	-0.4108*** (0.007)	-0.5697 *** (0.002)
SIZE	0.1394*** (0.000)	0.1469*** (0.000)	0.1408*** (0.000)	0.1686*** (0.000)	0.3630*** (0.000)
LIQ	-0.0165** (0.023)	-0.0171** (0.023)	-0.01711** (0.013)	-0.0180** (0.017)	-0.0128 (0.176)
TANG	-0.0290*** (0.003)	-0.0316*** (0.001)	-0.0296*** (0.002)	-0.0303*** (0.002)	0.7914 (0.106)
TAX	0.0073*** (0.005)	0.0070*** (0.006)	0.0074*** (0.005)	0.0078*** (0.002)	0.0084*** (0.005)
x^2	140.43*** (0.000)	578.11*** (0.000)	435.32*** (0.000)	239.46*** (0.000)	112.04 (0.000)
Log Likelihood	-2628.47	-2614.1642	-2617.115	-2377.46	-1659.40
δ^2u	0.9410**	0.9560**	0.9529**	1.0682**	1.2519**
Obs.	5414	5414	5414	5236	4501
No. of Firms	372	372	372	372	369

Notes: Dependent variable is DMS1. ***, **, * are one, five & ten percent significance levels. P-values given in parentheses. δ^2u is the variance of error term. Row wise MAC abbreviation used for macro variables. Column one shows the results of baseline model, impact of CFV on DMS. Column (2) report the findings of inflation rate role on the relationship among CFV and DMS. Column (3) shows the GDP growth role on the relationship between CFV and DMS.

Column (4) indicates the money supply role on the relationship among CFV and DMS. Column (5) findings indicate the role of interest rate in the relationship among CFV and DMS.

General to specific approach has been used as suggested by Hendry (1995). By following this approach, dropped the insignificant variables sequentially such as leverage and growth opportunity.

Table 3. Column one baseline model report that the coefficient associated with CFV is negative and statistically significant at one percent level. The negative sign of CFV suggest that when CFV increases by one percent, the likelihood of holding shorter (longer) DMS1 increases (decreases) by 0.07 percent. This result is in line with reasoning based on screening theory(Diamond, 1991; Stiglitz & Weiss, 1981) and signaling theory (Diamond, 1991; Flannery, 1986) and consistent with the empirical findings of (González, 2017; Keefe & Yaghoubi, 2016; Memon et al., 2018). Overall, results support the hypothesis and designate that if firms face high CFV, they are more likely to choose short-term debt maturity.

The variable inflation (Column 2) is negatively significant at one percent level exhibit that when inflation rate is high in the economy, the more likely is that firms choose debt of short-term debt maturity structure. The coefficient associated with

inflation show that as inflation increases by one percent, the probability of choosing short term debt increases by 27 percent. Inflation is generally considered as an indicator to measure the government capacity to manage the economy, and it gives information about the currency stability in long-term contracts. Debt contracts are usually based on nominal terms, and therefore high inflation rate mostly raises the interest rate risk faced by firms that may move the lenders away from long-term debt. This result is consistent with the following studies (Fan et al., 2012; Keefe & Yaghoubi, 2016; Memon et al., 2018).

Similarly, the coefficient associated with GDP growth (Column 3) is negatively significant at one percent level. GDP growth coefficient shows that as GDP growth increases by one percent, the probability of selecting short term debt increases by 6.68 percent. This evidence supports the claim of Myers (1977) stated that firms can overcome the underinvestment problems by choosing short-term debt maturity. In addition, when GDP rate is higher in the economy, the economic situation is better, and the investment chances are more, with more investment chances banks still offer short-term loans in order to avoid risk. Hence, the corporate DMS is the short-term debts. This result supports the existing empirical study of (Etudaiye-Muhtar et al., 2017). The variable money supply (Column 4) is negatively significant at one percent level indicates that when money supply increases in the economy, the more likely is that firms tend to reduce the long-term debts and start to choose short term debt in order to reduce the agency cost. The coefficient of money supply indicates that as money supply increases by one percent, the probability of choosing short term debt increases by 7.67 percent. This result is in line with the following studies (Hajiha et al., 2014; Mokhova & Zinecker, 2014).

Interest rate (Column 5) appears to be directly related to DMS1 at one percent level indicate that as the country interest rate increases by one percent, there is 4.55 percent chance is that firm select debt of long-term debt maturity. The positive sign of interest rate is according to our expectation and in line with the findings of Rehman (2016) and Antoniou et al. (2006) who claim that when interest rate increases it offers more tax saving to firms. Hence, firms choose debts of longer maturitity. In addition, this result support the tax hypothesis (Brick & Ravid, 1985) stated that long-term debts increase tax gain, if the term structure of interest rate is upward sloping.

The control variable return on assets are inversely significantly related to DMS1 at one percent in all models. This result is not according to our expectation but support the Myers and Majluf (1984) who claim that profitable corporations demand declines for debts relative to the less profitable corporation, because they are expected to have enough internal funds to finance their projects and operations. Our result is consistent with the following empirical studies (Mateus & Terra, 2013; Serrasqueiro

& Rogão, 2009). Firm size is positively significantly related to DMS1 at one percent level. The positive sign of firm size supports the signaling hypothesis. Flannery (1986), explains that large size firms have lower asymmetric information, higher tangible assets comparative to future investment opportunities. Therefore, they have easier access to long-term debt markets. Moreover, results support the agency cost hypothesis Myers (1977), stated that the agency problem among stockholders and lenders, such as risk shifting and claim dilution, may be predominantly severe for small firms. Hence, bondholders attempt to control the risk of lending to small firms by limiting the long-term DMS1. The result supports the empirical findings of (González, 2017; Keefe & Yaghoubi, 2016; Memon et al., 2018).

The liquidity coefficient is negative and significant at five percent level. This inverse relationship supports the idea of the liquidity risk hypothesis Myers and Rajan (1998) stated that highly liquid firms are not able to issue long-term debt, it may be because of agency cost related to free cash flows. Liquid assets do not motivate for long-term borrowings, as the lenders are exposed to the risk that the manager may shift to a riskier project or the firm's situation worsen over time. The result is in line with (Deesomsak et al., 2009; Mateus & Terra, 2013).

The tangibility coefficient is significantly inversely related to DMS1 at one percent level. This result is not according to our expectation but support the empirical findings of Lemma and Nagash (2012) and Memon et al., (2018). This inverse relationship may be because firm's with high fixed assets experience stability in earning and able to generate funds internally in order to avoid external financing.

The coefficient of tax rate is positive and significant at one percent level. This result supports the idea of tax hypothesis, Brick and Ravid (1985) claimed that tax rate is positively related to DMS1, because of high tax shield benefits for long-term debt. This effect may be attained because of the upward sloping yield curve or intrinsic structure of corporate debt. This result is consistent with (Custódio, Ferreira, &Laureano, 2013; Fan et al., 2012). The comprehensive discussion of interactive terms (CFV*MAC) are given in section 4.1.1.

Next, given below table 4. report the results of dynamic panel model, One step-system GMM for baseline and interactive analysis.

Table 4. report the results of one-step system GMM most of the estimated results are same as table3. The baseline model reports an inverse relationship between CFV and DMS2. Macroeconomic variables such as inflation, money supply show a significant inverse relationship with DMS2. However, GDP growth and interest rate report a positive significant relationship with DMS2. The sign of GDP growth is contradicting

Table 4: CFV and DMS2: Role of Macroeconomic Variables

Variables	(1) Baseline	(2) Inflation	(3) GDPG	(4) MS	(5) Interest Rate
CFV	-0.0252** (0.019)	0.0384*** (0.000)	-0.0477*** (0.000)	0.0958* (0.059)	0.1414*** (0.000)
Mac	-	-0.2093** (0.034)	0.5557** (0.045)	-0.2612* (0.056)	1.6637*** (0.000)
Mac*CFV	-	-0.0038*** (0.000)	0.0144*** (0.000)	-0.0068* (0.063)	-0.0111*** (0.000)
LEV	-0.0247 (0.969)	0.9332 (0.189)	0.9262 (0.271)	0.8131 (0.337)	0.9760 (0.191)
SIZE	-1.8436*** (0.004)	1.5795** (0.035)	2.2819*** (0.003)	1.8958** (0.023)	-0.4036 (0.466)
LIQ	0.0112** (0.047)	-0.0049** (0.015)	-0.0051** (0.010)	-0.0057*** (0.005)	0.0115** (0.017)
TANG	0.0182 (0.890)	0.2231** (0.010)	0.2286** (0.032)	0.2688*** (0.005)	11.6131** (0.056)
GROWTH	-0.0193 (0.707)	0.0669 (0.207)	-0.00804 (0.906)	0.03803 (0.587)	-0.0331 (0.537)
$DMS_{(t-1)}$	0.8059*** (0.000)	0.7145*** (0.000)	0.7047*** (0.000)	0.6973*** (0.000)	0.7666*** (0.000)
Constant	17.0949*** (0.001)	-2.3199 (0.653)	-11.5533* (0.063)	-9.9538 (0.098)	-9.1814 (0.155)
Obs.	4813	4813	4813	4813	4813
No. of Firms	368	364	368	368	365
Time Dummies	Yes	Yes	Yes	Yes	Yes
No of Instruments	54	64	46	46	60
F-stats	31.55*** (0.000)	82.93*** (0.000)	62.39*** (0.000)	55.13*** (0.000)	37.30*** (0.000)
Hansen-J Test (P-Values)	0.587	0.177	0.357	0.195	0.440
AR(2) (P-Values)	0.297	0.192	0.275	0.236	0.536

Notes: As for table 3. except this table report the results of system GMM.

Dependent variable is DMS2. Following insignificant variables dropped such as: return on assets and tax rate by using general to specific approach. Hansen-J test (P- values) show that instruments are valid. AR (2) p-values indicate that no second-order serial correlation exists in our model.

with table 3. GDP growth positive relationship with DMS stated that firms in higher economic growth countries borrow more long-term debts. This result support the overinvestment hypothesis (Jensen,1986). According to overinvestment hypothesis, when economic growth is higher more investment opportunity arises and firms undertakes higher investments, as a result they borrow long-term debts. This result is similar with the empirical findings of (Awartani et al., 2016; Hajiha et al., 2014).

To analyze the combined impact of CFV on DMS2 given the role of macroeconomic factors, this study taken the partial derivative of (equation 4) of CFV with regards to DMS. The partial derivative leads to Equation (14) below

$$\frac{\partial DMS2_{it}}{\partial Cfv_{it}} = 0.0384 - 0.0038 Inf_{it} \quad (14)$$

where both γ_2 and γ_4 have opposite signs, explain that partial increases in inflation leads to create a CFV inverse impact on DMS2. By applying the same procedure for other macro variables, the results show that CFV and macro variables are substitutes in explaining the relationship with DMS2.

4.1.1. Conditional analysis

To estimate the effect of CFV on DMS2, this study assuming the macro variables at different levels of percentiles. The results of each macro variables at low, median and high level of percentiles are given in table 5.

Table 5: Conditional Effects of Cash Flow Volatility on DMS2 at Varying Levels of Macro Factors

	INF		GDPG		MS		INTEREST	
Percentiles	One-step SYS-GMM	Two-way Fixed Effect	One-step SYS-GMM	Two-way Fixed Effect	One-step SYS-GMM	Two-way Fixed Effect	One-step SYS-GMM	Two-way Fixed Effect
P_{25} (low)	-0.0234*** (0.001)	-0.0041* (0.077)	-0.0019 (0.663)	-0.016*** (0.000)	-0.0265*** (0.007)	0.0145** (0.033)	0.0438*** (0.000)	0.0627*** (0.000)
P_{50} (Median)	-0.0104** (0.039)	-0.0083*** (0.000)	0.0178*** (0.001)	-0.0018 (0.425)	-0.0203** (0.011)	-0.0103*** (0.000)	0.0107 (0.173)	0.0611*** (0.000)
P_{75} (High)	0.0026 (0.561)	-0.0109*** (0.000)	0.0341*** (0.000)	0.0097*** (0.002)	-0.0142** (0.028)	-0.0122*** (0.000)	-0.0093 (0.136)	-0.0572*** (0.000)

Notes: ***,**,* are 1, 5, & 10% level of significance. P25 , P50 , P75 are the 25th ,50th and 75th percentiles. P- values given in parenthesis.

In order to determine the conditional impact of CFV on DMS2 at different percentiles (25th, 50th, 75th) of macro variables, this study estimated the conditional analysis. Table 5. shows the conditional effects of macroeconomic factors, evaluated at the 25th, 50th, and 75th percentiles. Regarding inflation, the system GMM results

show a significant negative sign at lower and median levels while at a higher level it becomes insignificant with positive sign. The magnitude of the coefficient is decreasing over percentiles. The two-way fixed effect model results indicate that coefficient carries a negative sign at all levels. Overall, the conditional effects results indicate the adverse effect of CFV on DMS at the varying level of inflation, It may be due to the fact that in the presence of inflation in an economy firms use short-term maturity debt, because creditors are not willing to increase long term debt due to fear of bigger loss of value on loaned capital in an inflationary environment (Awartani et al., 2016).

Regarding GDP growth, result shows the inverse impact of CFV on DMS2 at a lower level of GDP growth in both models. However, an improvement in GDP growth ease the initial adverse effect at a higher level (75th percentile) in both models. This result indicates that at a higher GDP growth, the impact of CFV on DMS is positive. It may be due to the fact that when economic growth is higher, firms tend to start long term debt maturity because in developing economies investment opportunity arises, and firms undertake higher investments, as a result, they borrow long-term debts (Jensen, 1986).

The impact of CFV on DMS2 is negative at varying levels of MS in system GMM model. However, two-way fixed effect model at lower level of money supply CFV shows a positive relationship with DMS2. However, at a higher level, it shows an inverse relationship between CFV and DMS. Overall, results indicate that when rate of money supply is high in the economy, leads to CFV, firms tends to reduce the long- term debts in order to decrease the agency cost. In addition, when money supply increases in the economy, enterprises have more investment opportunities based on agency cost theory (Jensen & Meckling, 1976), they start to choose short debt maturity in order alleviate the agency cost because of underinvestment and overinvestment hypothesis. Therefore, an increase in the level of money supply promotes the usage of short-term debt in the economy.

Regarding interest rate, the conditional effect results report the positive effect of CFV on DMS2 at an initial and median level of interest rate in both models. However, at a higher level of interest rate the impact of CFV on DMS2 is negative in both models. Overall, the results of both models indicate that when interest rate is high in the economy, having CFV firm's decrease the long-term debts it may be because higher cost of borrowings firm's not willing to borrow more long-term debts and prefer to choose short term debt.

5. Conclusion and Policy Recommendations

This study explores the role of macroeconomic factors in the relationship between

CFV and DMS by using a sample of 380 listed non-financial firms of Pakistan covering the period from 1999 to 2018. The existing literature about the relationship between CFV and DMS is inconclusive and limited for developing economies. This study addressed this relationship for developing country, Pakistan by applying econometric methods that accounts for non-linearity (Ordered Probit regression), and alternative estimation methods (Dynamic panel estimation methods). Across all these approaches, CFV is an important determinant of a firm's DMS. The study findings report a significant inverse relationship between CFV and DMS. Additionally, results indicate that DMS is also sensitive to macroeconomic factors.

Secondly, this study estimated the CFV relationship with DMS by considering the role of macroeconomic factors such as Inflation, money supply, GDP growth, and interest rate. Overall, the results confirm that the role of macroeconomic factors are significant in determining the CFV relationship with DMS. Further, the results provide evidence that both CFV and macroeconomic factors play a substitution role in explaining the CFV relationship with DMS. In other words, role of macroeconomic factors weakens the CFV relationship with DMS. Additionally, this study estimated the conditional effects of CFV on DMS at varying levels (25th, 50th ,70th) percentiles of macroeconomic factors. The results of conditional effects report the adverse effect of CFV on DMS at higher level (75th percentiles) of inflation, money supply and interest rate while the effect of CFV on DMS is positively significant at higher level of economic growth. Therefore, the result indicates that when in the economy inflation rate, money supply and interest rate is high, the effect of CFV firms short- term debts. Conversely, if country experiencing higher GDP growth, the effect of CFV leads to increase the firm's usage of long- term debts.

Lastly, these research findings suggest some subsequent recommendations: Firstly, firms when facing variation in the earning level may mitigate their financial distress, cost of bankruptcy by choosing short-term maturity debts. Secondly, the role of macroeconomic factors should be considered by the financial managers in the decision-making process as it effects the firms DMS. Thirdly, the findings suggest that non-financial firms, banks, financial institutions may lessen their risk of non-performing loans by limiting their financing when experiencing high CFV. Fourthly, our study findings might also be useful for the investors as they can inspects the firm risk level by considering the variability in cash flows before taking any investment decisions. Lastly, this study analyzed that firms in Pakistan mostly rely on both short-term and long-term debts (that is not as long as debentures & note payables). Government should pay attention to introduce more suitable policies that promote the development of the short and long-term debt markets.

6. Limitations

This study is limited to the overall sectors of listed non-financial firms of Pakistan. Due to data constraints in this study non-listed firms are missing, though non-listed firms may provide evocative insight into macro factors and their impact on a firms DMS.

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8. Appendix

Table A1: Summary Statistics and Pairwise Correlation

Variables	DMS2	CFV	LEV	ROA	SIZE	LIQ	TANG	GROWTH	TAX	INF	GDPG	MS	INTEREST
N	5355	6064	6090	6069	6109	6062	6048	5531	5467	7600	7600	7220	5700
Mean	29.89	1.3678	0.1525	7.443	65.09	0.226	0.173	0.132	27.78	7.435	4.384	13.29	11.19
Std Dev	22.03	43.61	3.35	1.53	11.58	1.935	2.85	1.347	1.278	4.4318	1.5732	2.8721	2.3446
Min	0.0028	0	0	0	0.072	0	0	0	9.897	2.5293	1.6067	8.6208	7.2575
Max	100	1912	100	100	100	100	100	100	100	20.29	7.547	17.92	14.53
P25	12.15	0.0095	0.0078	7.4045	58.77	0.0713	0.022	0.0968	27.73	3.925	3.169	11.74	8.755
P50	26.42	0.0133	0.0111	7.4097	64.93	0.1133	0.033	0.1059	27.76	7.317	4.536	13.22	11.73
P75	43.35	0.0243	0.0139	7.4164	71.96	0.1649	0.046	0.1194	27.79	9.373	5.666	14.76	13.52
DMS2	1												
CFV	-0.0598	1											
LEV	0.0605	0.0037	1										
ROA	-0.066	0.0283	-0.292	1									
SIZE	0.0376	-0.148	-0.2552	0.1682	1								
LIQ	0.0894	-0.0268	-0.2783	0.187	-0.0242	1							
TANG	0.4092	0.0229	0.1529	-0.307	-0.179	-0.2603	1						
GROWTH	0.0451	-0.0098	-0.0422	0.0697	0.054	0.018	-0.0164	1					
TAX	-0.014	-0.0042	0.006	0.0128	0.0232	0.0001	-0.0262	-0.002	1				

INF	0.0352	-0.0296	0.0451	0.0239	-0.1032	-0.0326	0.0442	0.0123	-0.0128	1			
GDPG	-0.0849	0.141	-0.0074	-0.0472	-0.0228	-0.0508	0.034	0.0291	-0.0005	-0.7707	1		
MS	-0.054	0.1256	0.0431	-0.0041	-0.164	-0.0855	0.1023	0.073	0.0002	0.0252	0.2645	1	
INTER-EST	0.0984	-0.0936	0.0252	0.0663	-0.0274	0.0356	-0.018	-0.0176	-0.0023	0.7192	-0.876	-0.1445	1

Notes: This table report the summary statistics and pairwise correlation among explanatory variables. Summary stats shows each variable number of observations, mean, standard deviation, minimum value, maximum value, 25th percentile, 50th percentile (median) and 75th percentile. We have normalized the firms specific variables data through minimization and maximization method.

Table A2: Summary of Debt Maturity Structure (DMS1) Categories

Categories	Description	Freq.	Percent	Cummulative
1	Firms holding zero debt	10	0.16	0.16
2	Firms holding only short-term debt	670	10.97	11.14
3	Firms holding short term debt and long term debt maturity (that is not as long as debentures & note payables)	5049	82.69	93.83
4	Firms holding long term debt including debentures and note payables	377	6.17	100
	Total	6106	100	

Notes: This table summarizes the categories of debt maturity structure shows the frequency, percentage and cumulative percentage of each category for a sample of non-financial firms of Pakistan listed in Karachi Stock Exchange of Pakistan during the period from 1999-2018.

Table A3. Firms Sector Category

Categories	Sectors	No of firms
1	Textile: Spinning, Weaving, Finishing of Textile	155
2	Chemicals, Chemical Products &Pharmaceuticals	41
3	Motor Vehicles, Trailers & Autoparts	23
4	Manufacturing n.e.s.	31
5	Electrical Machinery & Apparatus	5
6	Food (Sugar and others)	43
7	Other Non-Metallic Mineral Products: Cement and Minerals	25
8	Fuel and Energy	16
9	Other Services Activities	10
10	Information, Comm. & Transport	11
11	Coal and Refined Petroleum products	9
12	Paper, Paperboard and Products	9
13	Miscellaneous	2
	Total	380