Capital Structure Volatility and Dividend Policy: Evidence from Thai Listed Firms

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ความผันผวนของโครงสร้างทางการเงินกับนโยบายเงินปันผล: หลักฐานจากบริษัทจดทะเบียนของไทย

น.ส.ทิพปภา กลิ่นเล็ก

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This study attempts to identify the factors affecting capital structure volatility using firm-specific on a sample of listed Thai firms from 2001 – 2020. This study documents that firm-specific factors impact capital structure volatility. Firms with higher growth opportunities, more profitable and have greater change in their assets tend to vary their capital structure more.

In the second part, after determining the factors influencing capital structure volatility. This study provides the evidence of capital structure volatility (CSV) on dividend policies. And find that a high level of CSV is negatively associated with dividend policies. This paper also examines the variation of dividend policy across industries. The results illustrate that there is a variation of dividend policy across industries and factor influencing dividend policy also different across industries. Moreover, defensive industry pays higher dividend than non-defensive industry.

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1. Introduction

Capital structure is one of the main issues in corporate finance. Capital structure is a combination between debt and equity. Firms can use internal funds or external funds for their financial needs. Internal funds are funds that internally generated retained earnings and external sources are from debt or equity. Ever since the work of Modigliani and Miller (1958), numerous numbers of research have developed to explain the capital structure decisions. For example; trade-off theory (Modigliani & Miller, 1958, 1963) and pecking order theory (Myers & Majluf, 1984).

According to trade-off theory (Modigliani & Miller, 1963) firms will choose between debt and equity according to the cost and benefits. Firms will get benefits from tax of debt. However, the more debt firms choose the more financial distress costs. Another cost that firms have to consider when weighing between cost and benefits are agency costs (Jensen & Meckling, 1976). Managers will transfer risks from shareholders to debtholders. Shareholders have intensive to accept risky projects that can create wealth for them whereas debtholders will be worse off if the projects do not succeed. Firm will try to maximize the firm value in financing choice by weighing the costs and benefits of debt. Thus, firms have a target capital structure and tend to maintain their capital structure.

In contrast, pecking-order theory (Myers & Majluf, 1984) firms have no optimal capital structure. Because of asymmetric information between managers and shareholders that can create agency costs. Firms will try to minimize these costs; hence they will finance their financial needs in a hierarchy order according to the costs. Firms prefer internal sources over external sources because internal sources cost less than external sources. Thus, firms will use retained earnings, followed by debt, and equity financing as the last resort.

However, in the real world, firms tend not to follow those theories. According to trade-off theory, firms have target leverage ratio. However, DeAngelo and Roll (2015) find that in the US, capital structure stability is the exception, not a rule. Rather than study on capital structure, they study the volatility of debt ratio, which is new to research in this area. Follow by Campbell and Rogers (2018), they also find that capital structure in European firms is not stable. Chong and Kim (2019) also find that Korean firm has varied their capital structure over time.

Past empirical literature finds many variables are related with capital structure decisions. For example; size is positively related to leverage ratio (de Jong et al., 2008; Li & Islam, 2019). Tangibility has a positive relationship of leverage ratio (Jensen & Meckling, 1976). Profitability has negative relationship with leverage ratio (de Jong et al., 2008; Myers & Majluf, 1984). Growth opportunities and leverage are negatively related (Jensen & Meckling, 1976). These studies provide the evidence of how firms establish their capital structure. Even though, the number of studies try to examine what determine capital structure of the firms. However, very few researches have tried to examine the determinants of capital structure instability. Therefore, in the first part, I intend to study what factors that affect capital structure volatility, especially firm-specific factors.

Dividend policy has captured the interests for researchers for years, it is one of the most debatable topics in corporate finance literature, many researchers have been studied what determine dividend policy for years. Dividend is important because it is associated with numbers of the firm's stakeholders (shareholders, debtor, managers) as dividends provide certainty about firm's well-being. Dividend policy refers to the payout policy that a firm follow in making dividend decisions. The debates of dividend policy have been started since Linter (1956), who propose that dividend payout policy is based on current earnings and past dividends. Dividend irrelevance theory suggest that value of firms is independent of dividend payment (Modigliani & Miller, 1958). In contrast, dividend relevance theory suggest that value of firms is related to dividends (Gordon, 1962). In spite of the extensive research on dividend policy for many decades, no universally explanation is achieved (Baker, 2011). Even though, the number of studies try to examine what determine dividend policy of the firms for both developed market and emerging market (Aggarwal & Kyaw, 2010; Fama & French, 2001; Kaźmierska-Jóźwiak, 2015). Many firm-specific factors were used to determine the decision of dividend payments. After I intend to identify are the determinants of capital structure volatility. Then, in the second part of research, the question arises whether capital structure instability affects dividend payments or not.

Some prior studies mention that there is industry effect that influence dividend policy, as each industries have similar earnings prospects, investment opportunities, and resources accessibility. As a result, firms in a same industry should have similar dividend policies (Michel, 1979; Pinto & Rastogi, 2019). However, these studies have been conducted mostly on developed markets. Moreover, firm can be categorized as defensive or cyclical based on their performance during the different phases of economy. Defensive firms have more performance's stability in any phase of economy, while cyclical firms exhibit performance directly related to the business cycle.

From the above past empirical evidences, this paper contributes to the existing literature in the following ways. Firstly, this study is among few of studies that aim to study the determinants of capital structure volatility rather than the level of capital structure. This study provides evidence that what firm characteristic affects the volatility of capital structure. Secondly, this study is the first to extend the studying of determinants of dividend payments by using the capital structure volatility factor. Because the instability in capital structure should not be neglected when considering the factors affecting dividend payments as it is like a risk of firm as well as earnings or cash flow volatility. And thirdly, this study intends to evaluate the dividend behavior across sector in Thailand, since past literatures have not been conducted to Thai firms. A deeper understanding of how firms determine their dividend policy would be beneficial for practitioners and shareholders. Because it is not only enhance the forecasts of dividend payment but also increase the confidence level of investor that can improve overall market activity.

The rest of the paper is organized as follows. Section 1 introduction and background. Section 2 literature review. Section 3 data and methodology. Section 4 results and Section 5 conclusion.

2. Literature Review

2.1. Theoretical Literature

2.1.1. Trade-off Theory

Under the perfect market assumptions, the theory suggests that the value of firm is irrelevant to its capital structure. High levered firms or lowed levered firms have no difference in the firm's value (Modigliani & Miller, 1958).

In the trade-off theory (Modigliani & Miller, 1963), firms choose how much to finance between debt and equity by balancing the advantages of debt against costs of financial distress. When firms increase the debt ratio to gain tax benefits; as a result, the value of firms increases. Firms maximize their value by maximizing the use of debt. However, when keep increasing debt level then firm's value starts to decrease due to higher distress costs, such as bankruptcy costs. Therefore, bankruptcy costs and leverage ratio are negatively related. In conclusion, trade-off theory implies that firms have a target leverage ratio and will maintain their target ratios.

Later, there is evidence that consistent with trade-off theory; firms have target leverage ratios. They suggested that high market-to-book firms have low target debt ratios. The high stock return has a higher probability to issues stock but is not related to the probability of debt issuance. To offset the excess leverage ratio, unprofitable firms issue equity; whereas profitable firms do not likely to offset the deficit leverage ratio by debt issuance (Hovakimian et al., 2004).

In contrast, dynamic trade-off theory states that it is costly in issuing and repurchasing debt to adjust the capital structure to the target. Firm's debt ratios vary over time and firms will only adjust their capital structure only when benefits outweigh the costs of adjusting (Fischer et al., 1989). Inconsistent with dynamic trade-off theory, some paper finds that firms infrequently adjust their capital structure due to adjustment costs. Level of leverage, change in leverage, and past financing decision are important determinants of future financing decision. However, because of adjustment cost, firms likely to maintain leverage within the target range (Leary & Roberts, 2005).

Later, it was found that Malaysian firms adjust the capital structure to target ratios. Overleveraged firms adjusted their leverage ratios faster than underleveraged firms due to bankruptcy costs and agency costs, which is also consistent with dynamic trade-off theory (Abdeljawad et al., 2013).

2.1.2. Agency Costs

According to agency cost theory, two types of agency problems which is the result of conflicts of interest are: 1) between bondholders and shareholders and 2) between shareholders and management. These agency problems cause agency costs. Managers do not fully responsible for their actions to the consequences and they incentives to consume on owner's benefits (Jensen & Meckling, 1976).

Free cash flow problems (Jensen, 1986) states that agency problems increase as the level of free cash flow increases. Managers may not act in the best interest of shareholders. Since, high level of cash available, managers would use some of the excess cash on the negative present value projects or use it for their benefits. As a result, decreasing in shareholders' wealth. The dividend, therefore, helps to mitigate agency costs as the level of free cash flow was reduced.

2.1.3. Pecking Order Theory

Myer and Majiluf (1984) suggest that financing choices are driven by information asymmetries between better-informed managers and less-informed investors. Costs of financing increase with the level of asymmetries. Therefore, firms prioritize their source of financing as a hierarchical order. Implying that firms have no target capital structure. Firms will use internal funds as the first order, which is retained earnings and move to external funds from debt and equity as the last order. External financing choices will be chosen when internal sources are insufficient. The retained earnings will be used first because it relatively has no cost. Equity issuance is more costly because agency costs caused underpricing of equity, investors believe that firms issue new equity when firms' values are overvalued. As a result, investors will lower the firms' value. In other words, the theory implies that agency costs are much more important than tax-shield benefits from debt financing.

2.1.4. Irrelevance of Dividend Policy Theory

Miller and Modigliani (1961) demonstrate that the value of firms is independent of dividend policy under assumptions of 1) perfect capital market, 2) investors are rational, and 3) perfect certainty. Shareholder's wealth is not affected by dividend policies. Capital gains and dividends are equivalent to shareholders because wealth is only affected by earnings that firms generated, not how firms distributed those earnings. In other words, shareholders calculate the value of firms based on future earnings, not dividends.

2.1.5. Relevance of Dividend Policy

(Gordon, 1962), develops the constant growth model. This model attempts to value stock price based on the assumptions that 1) growth rate (g) and rate of return (r) are constant 2) all free cash flow is paid back as dividends 3) dividend growth rate is constant. The value of a stock is equal to the discounted value of expected future value of dividends.

The formula for the Gordon Growth Model is as followed:

$$P_0 = \frac{D_0(1+g)}{r-g} = \frac{D_1}{r-g}$$

Where; P_0 = intrinsic stock value

D_0 = current year dividend

r = required rate of return

g = terminal growth rate

2.1.6. Dividend Signaling Theory

After Miller and Modigliani's (1961) idealistic market assumptions. Several studies develop a dividend signaling theory that is in imperfect markets, there is informational asymmetry; managers know more information than shareholders, therefore, a dividend is used as a costly signal to convey information of a firm's future prospect to shareholders.

It was stated that dividends are costly because once firms pay dividends, they have to reduce the fund used in investment. Only the high earnings firm can pay dividends because low earnings firms cannot, therefore, shareholders can distinguish between these two types of firms from dividends signaling (Miller & Rock, 1985).

2.2. Relevant Researches

2.2.1. Capital Structure Studies

Although several studies have been conducted, the results are still mixed. On the basis of trade-off theory, (Jalilvand & Harris, 1984) find that firms in the US would adjust the capital structure to their long-term target. study the financing decision in US firms and find that in imperfect market conditions, the speed of adjustment would be affected by firm size and market condition (interest rates and stock price) since these factors affect costs of adjustments. Even though the speed of adjustment varies among firms and it depends on the remaining fund needs. Larger firms adjust to their target debt ratio faster and use more long-term debt than smaller firms. However, larger firms adjust their capital structure to the equity target level slower than smaller firms, and use less equity when they needed funds.

Asset restructuring significantly impacts target leverage ratios. Downsizing firms tend to lower their target debt ratios, whereas upsizing firms increase their target debt ratios. Downsizing firms prefer to repurchase debt, whereas upsizing firms prefer to issue new debt to move to their new target ratios. The changes in target leverage became steady after two years of asset restructuring (Cook et al., 2016).

On the other hand, other studies are consistent with pecking-order theory, which firm has no target capital structure. Fischer et al. (1989), find that firms vary their capital structure ratio. Especially, firms that are smaller, and have lower bankruptcy costs will have a wider range of leverage ratios. Firms issued debt when internal funds are insufficient and reluctant to issue equity because they feel their stock is undervalued (Leary & Roberts, 2005).

Jong (2011) found that pecking order theory describes a firm's decisions for issuance better than repurchase decisions. For over-levered firms, but do not have restrictions on debt issuance, firms still increase their leverage by issuing debt. However, for repurchase decisions, under-levered firms likely to repurchase equity more than debt repurchase to move toward their targets (de Jong et al., 2011).

Moreover, some studies provide evidences that supports both theories. Graham and Harvey (2001) find that 19% of the firms do not have a target debt ratio, 37% have flexible target ratios, 34% have a range of target ratios, and only 10% of firms have a very strict target ratio. When firm's capital structure deviate from the target, they will try to adjust it back to the target. However, the adjustment takes time and the adjustment costs are the main concerns when firms try to adjust their capital structure to the target. Firms, especially small firms, concern about transaction costs more when deciding to adjust leverage.

However, in recent studies, rather than studying the level of capital structure, DeAngelo and Roll (2015), focus on the volatility of debt ratios. They find that US firm's leverage ratios fluctuate over time and conclude that stability is temporary. However, they do not focus on the causes of the debt instability. They suggest that it might be related to the budget constraint.

Capital structure in European firms is not stable. Many firms allow their capital structure to move considerably over time, while many others choose to maintain strict capital structures. Firms with the most volatile debt ratios tend to be smaller and were less profitable firms. They use the concept of theory of Corporate Finance Trilemma to explain why the capital structure of European firms is not stable. Some firms that choose a stable debt ratio must allow cash holdings and equity payout to be fluctuated. Other firms prioritize cash holdings and equity payouts, then debt must be fluctuated. Thus, firms cannot choose their ideal policies for equity payouts, cash holding, and debt simultaneously (Campbell & Rogers, 2018).

In recent study, Korean firms have changed their leverage ratios over time. They find that capital structure volatility cannot be explained by Fama-French-Carhart 4 factors. Then, they turn to regress on variables representing a shock to credit market conditions. The results indicate that a shock to the credit market and the capital structure volatility factor are negatively related. Finally, they examine the relationship between capital structure volatility and stock returns. The results indicate that capital structure volatility negatively affects stock returns (Chong & Kim, 2019).

Uncertainty, by using asset volatility as an uncertainty, lowers the target firm's leverage ratio. This uncertainty is the most important factor affecting the firm's target leverage among other factors they used (Im et al., 2020).

2.2.2. Capital Structure Determinants

Empirical literature on capital structure finds many variables are related with capital structure decisions. According to trade-off theory, bankruptcy costs increase with the level of leverage. Therefore, bankruptcy costs and leverage ratio are negatively related. However, larger firms usually have lower bankruptcy costs because they can access to financial sources easily than small firms. Therefore, size is positively related to leverage ratio (Li & Islam, 2019). However, Aggarwal and Kyaw (2010) find that the level of debt decreases with the degree of multi-nationality. These results conflict with the theory that multinational firms should have a higher debt ratio than domestic firms due to their larger size and higher debt capacity.

Profitability is also an important determinant that affect capital structure decisions. As pecking-order theory suggestion, firms raise capital by retained earnings, then to debt, and to issuing new equity. Thus, more profitable firms will have lower leverage ratio as their can use their internal funds (Myers & Majluf, 1984). Which can be implied that profitability has a negative relationship with leverage. Moreover, due to the agency costs which arise from conflicts between shareholders and debtholders. Firms will try to minimize these costs (Jensen & Meckling, 1976). Therefore, firms are likely to issue equity rather than borrowing to fund new projects.

Due to agency costs, shareholders have incentive to take risky investments than debtholders. Therefore, debtholders may make a contract to managers for prohibiting them not to take risky investments. As a result, debtholder may require higher interest rate. And because underinvest problems is more severe for high growth firms; thus, they will use equity rather than debt financing. In consistent, due to agency problems, high growth firms should not issue debt (Myers, 1977). Hence; growth opportunities and leverage are negatively related.

In addition, if firms have high proportion of asset tangibility, they can use those assets as collateral to reduce debtholder risks (Jensen & Meckling, 1976), implying that tangibility and leverage ratio have a positive relationship (Li & Islam, 2019).

2.2.3. Dividends Policy

Dividend policy is a practice, a firm uses to distribute earnings to the shareholders. Firms can decide on a portion of earnings either paying out to shareholders as a dividend or retaining back to the firm to be reinvested. Dividends are the simplest way for firms to communicate how well the firms is doing to investors. Dividend policy has influenced the investors' decision; thus, firms are concerned about the dividends policy.

Lintner was the first to conduct the dividends model. He suggests that each firm has a target dividend payout ratio. Dividend payout based on the current earnings and past dividends. Moreover, firms aim to maintain a stable dividend payout because managers believe that shareholders prefer steady dividends. Thus, dividend changes can convey important information about the future prospects of firms. This model implies that current dividend is a function of current earnings and past year dividends (Lintner, 1956). Later, the study results support his model. Dividend payout is the function of current earnings and past dividends; besides, firms prefer stable dividends payout. Firms will only increase dividends when they are likely to maintain the dividends in the future (Fama & Babiak, 1968).

Fama and French (2001) find that among US firms during 1926-1999, the proportion of dividend payers have been declined. This decline is partly from changes in the characteristic of the firms. More dividend payers tend to be more like non-paying firms (i.e., high investment opportunities, low profitability). The benefits of dividends have declined though time might be because 1) larger stock option holder who prefers capital gains, 2) lower transaction costs for selling stocks, and 3) better corporate governance that can lower agency problems between managers and shareholders.

2.2.4. Determinants of Dividends Policy

After Lintner's model, several researches try to study the determinants of dividend policy. Many factors were used to explain the decision for paying dividend; for instance:

- Size

Size is one of the most important determinants factors affecting dividend payments. Jensen and Meckling (1976) argue that for larger firms, shareholders have less ability to monitor managers. Thus, there are high level of information asymmetries in large firms. Therefore, dividend payment is used to send a signal to shareholders for lowering agency costs. Fama and French (2001) find that larger firms in US tend to pay more dividend. Several studies also find a positive relationship of size and dividend policy in many countries both in Europe and Asia (Barros et al., 2020; Denis & Osobov, 2008; Tekin & Polat, 2020).

- Growth Opportunities

Several studies suggest that growth opportunities and dividend payments have negative relationship (Fama & French, 2001; Jabbouri, 2016). Firms establish lower dividends when they expected higher growth because firms will need higher investment costs to support growth in the future (Rozeff, 1982). Fama and French (2001) find that US firms with high investments tend to pay less. Firms that never pay dividends have the best growth opportunities whereas former paying firms have the lowest investment opportunities.

However, Denis and Osobov (2008) find that the relationship between growth opportunities and dividend payments are not the same across six countries (US, UK, Canada, Germany, France, and Japan). But the consistency in paying or not paying dividends on growth opportunities of non-dividend payments firms have the same negative coefficient in all six countries. Consistently, Tekin and Polat (2020) also find that in the UK, the relationship of growth opportunities and dividend policy are negative.

- Profitability

Several studies find that profitability and dividend are positively related. Fama and French (2001) find that the former payers firm have the lowest profitability. Denis and Osobov (2008) find that dividend payers tend to have a higher ratio of retained earnings to the book value of total equity. ROA has a positive relationship with dividend payout (Aggarwal & Kyaw, 2010). However, in some studies find that ROE has a negative relationship with dividend policy (Kaźmierska-Jóźwiak, 2015).

- Leverage

Various studies indicate a negative relationship between leverage and dividend policy (Aggarwal & Kyaw, 2010; Jabbouri, 2016). The interpretation of this negative relationship is that because firms have to maintain cash for paying debts, so they prefer to cut dividends.

- Risk

Aggarwal and Kyaw (2010) find that higher firm's beta result in lower dividend payout. A number of studies use P/E ratio as a proxy of risk. According to Kazmierska-Józwiak (2015), high P/E ratio associates with lower risk in investor's view because they expect higher earnings growth in the future. Hence, firms with high P/E ratio pay higher dividend. Risk and dividend policy have a negative relationship.

- Free cash flow

According to agency problems between shareholders and managers increase as the level of free cash flow increases (Jensen, 1986). Therefore, dividend payments can be used to reduce agency costs (Rozeff, 1982). Hence, free cash flow and dividend payment have a positive relationship. However, in recent studies, there is the evidence that free cash flow and dividend payout are negatively related (Aggarwal & Kyaw, 2010; Jabbouri, 2016).

- Industry Effect

Michel (1979) studies twelve industries in the US, and find that dividend payouts differ significantly across those industries.

Pandey (2003) examines the difference of dividend payout across industries. He reports that there are significant variations in dividend payout across six industries in Malaysia.

Pinto and Rastogi (2019) also find the evidence that dividend policies vary across industries in India and factors influencing dividend policies differ across sectors. Hence, they suggest that there is no single model to explain determinants of dividend payout for all sectors.

Other factors were used to investigate the relationship with dividend policy. For example; there is a positive relationship of multi-nationality on dividend payout. Multinational firms have a higher mean payout ratio than domestic firms (Aggarwal & Kyaw, 2010). The level of free float is positively related to dividend policy and the number of analysts is negatively related to dividend policy (Barros et al., 2020). Tekin and Polat (2020) find that different market structure affects dividend policies. In a less regulated market, which is firms that smaller and younger. These firms have a higher level of informational asymmetry. Hence, they pay higher dividend payments as they would use dividends as a signal to convey information to shareholders.

The above review of the literature shows that determinants of dividend policies have been studied broadly. Numerous papers focus on the different factors affecting a firm' s dividend policies including firm's characteristic (i. e. , size, profitability, leverage, growth, liquidity) or many other factors. However, there seems to be no study on capital structure volatility and its relationship with dividend policies. Therefore, in the next section, I will examine the relationship of capital structure volatility and dividend policy.

3. Data and Methodology

This section provides overall data and methodology in this study. The sample consists of firms listed in stock exchange of Thailand (SET). All data are obtained from Bloomberg database. Bank and financial institutions firms are excluded from the sample as their capital structures are different from non-financial firms because of various regulatory restrictions.

There are two main sets of data that I use in this paper. The first dataset is for examining the determinants of firms' capital structure volatility and the second dataset is for examining the relationship between capital structure volatility and dividend policies.

3.1. Capital Structure Volatility Determinants

3.1.1. Data and variables

The sample consists of listed firms on SET during 2001 to 2021. The final sample of 432 firms with 4,151 observations are employed after excluding incomplete data. Firm-specific factors are the major variables that be considered in examining the impacts on capital structure volatility. For the traditional literature, firm-specific factors are considered to be major determinants of capital structure. These firm-specific variables are 1) firm size (SIZE), defined as the natural logarithm of total assets; 2) profitability (ROA), defined as earnings before interest, taxes and depreciation divided by total assets; 3) market-to-book ratio (MB) as the proxy of growth opportunities, which is calculated by market value of total assets over book value of total assets; and 4) asset change (ASCHG) is also included to examine which firms has increased their asset base most.

The dependent variable is capital structure volatility. A method to reflect volatility is to use standard deviation (Chong & Kim, 2019). Capital structure volatility (CSV hereafter) is measured by the standard deviation of leverage ratio. I measure leverage in two ways: 1) book value of leverage, defined as book value of long-term debt to total assets and 2) market value of leverage, defined as book value of long-term debt to market value of total assets (Graham & Harvey, 2001). Market value of leverage is important as it reflects market information. To capture capital structure of firms, I use the long-term debt ratio as short-term debt contains of trade credits, which is influenced by different determinants, thus; the result of using total debt would be difficult to interpret (de Jong et al., 2008). I collect the quarterly data for total assets, long-term debt and market capitalization to calculate leverage ratio. The CSV is calculated using moving windows for every 20 quarters and calculate CSV for each period, following; Chong and Kim (2019). For example, in this study, BCSV at year 2020 is the standard deviation of book leverage ratio between 1st quarter of 2016 and 4th quarter of 2020, total of 20 quarters.

To calculate firm-specific variables, SIZE, MB and ROA is value for year t-5, to be consistent with CSV that collect up to 20 quarters. For example, CSV is the standard deviation of leverage ratio between 1st quarter in 2016 to 4th quarter in 2020, totaling of 20 quarters. Therefore, SIZE, MB and ROA is value of year 2015. And ASCHG is calculated by total asset in 4th quarter in year t minus asset in 1st quarter in year t-4. For example, ASCHG at year 2020 is calculated by total asset in 4th quarter in year 2020 minus asset in 1st quarter in year 2016, scaled by assets 1st quarter in year 2016. **Table 1** summarizes definitions and data sources for all variables used in the analyses.

Table 1

Variable definitions.

Variables	**Symbol**	**Definition**
Dependent Variable		
Book capital structure volatility	BCSV	The standard deviation of book leverage ratio, using 20 quarterly data moving windows.
Market capital structure volatility	MCSV	The standard deviation of market leverage ratio, using 20 quarterly data moving windows. Market value, defined as book value of total assets minus book value of equity plus market value of equity.
Independent Variable		
Firm’s size	SIZE	The natural logarithm of total assets
Return on asset	ROA	Earnings before interest, taxes and depreciation divided

Variables	Symbol	Definition
		by total assets
Market-to-book	MB	Market value of total assets over book value of total assets
Change in asset	ASCHG	Total asset in 4th quarter in year t minus total asset in the 1st quarter in year n-4, scaled by total asset in the 1st quarter in year n-4

3.1.2. Research Hypotheses

Size

Based on past literature firm that are smaller, and have lower bankruptcy costs will have a wider range of leverage ratios. Larger firms adjust their capital structure to the equity target level slower than smaller firms (Jalilvand & Harris, 1984). Moreover, Campbell and Rogers, (2018) have found that smaller firms have the most volatile leverage ratio.

H1*:* Size has a negative significant effect on CSV.

Profitability

According to pecking-order and asymmetric information theories, profitability has a negative relationship with leverage ratio. However, free cash flow problem states that firm will employ debt as a discipline to control manager's behavior not consume available cash for their own benefits. Implying that profitability has a positive relationship with leverage. Therefore, firms could use either more debt or equity under certain profitability which should impact positively to CSV. However, Campbell and Rogers, (2018) suggest that less profitable firms have more CSV.

H2*:* Profitability has a positive/negative significant effect on CSV.

Growth Opportunities

High growth opportunities firms will undertake all growth opportunities when they arise; thus, high growth firms face higher agency costs. Due to the agency problems between debtholders and shareholders, when manager plan to invest in risky projects, debtholders will require higher interest rate to compensate their risks.

Therefore, high growth firms are likely to use equity instead to reduce those costs (Jensen & Meckling, 1976). However, (Pandey, 2003) suggest that high growth firms have greater opportunities to retain their earnings for their future funds need. Thus, high growth firms likely to issue more debt. Therefore, firms could employ debt or use their equity for their growth opportunities which should impact positively to the capital structure volatility.

H3: Growth opportunities has a positive significant effect on CSV.

3.1.3. Model Specification

In order to examine the impacts of firm-specific factors on the CSV the study uses a panel analysis in which CSV is regressed on a set of determinants of CSV. The dependent variable is CSV and firm-specific factors as explanatory variables. To address the concern of reverse causality, lagged dependent variables are employed (As describe in section 3.1.1). Specify as followed: SIZE, MB, PROFIT and ASCHG. The regression takes the following form:

$$CSV_{it} = \alpha + \beta_1 SIZE_{it-5} + \beta_2 MB_{it-5} + \beta_3 ROA_{it-5} + \beta_4 ASCHG_{it} + \varepsilon_{it} \qquad (1)$$

(where CSV is alternatively BCSV or MCSV, and i denotes individual firms, t denotes time)

3.2. Capital Structure Volatility and Dividend Policy

3.2.1. Data and variables

The second data set is to examine the relationship of CSV on dividend policies. The study period covers year 2001 to 2020. The final sample consists of 400 firms with 4,340 firm-year observations for over 20 years. The dependent variable is dividend policies (DIV), I use three variables to measure firm's dividend policies: dividend payout ratio (DPR), dividend to sales (DTS) and dividend to total assets (DTA). DPR is defined as the total cash dividend paid in a given fiscal year to net income. In the sample, some firms that have negative income but pay dividend, those firms were deleted (Xu & Huang, 2021). DTS is defined as total cash dividend paid scaled by total sales revenue for a given year. DTS is more resistant than DPR if firm's net income drops dramatically due to economic downturn, and if firms do not cut their dividends significantly, then the fluctuation in DPR should be expected in those firms (Jabbouri, 2016). DTA is calculated as total cash dividend paid scaled by total assets of the period.

The key explanatory variable is CSV. The calculation of BCSV and MCSV is the same as in section 3.1.1., which calculated using moving windows for every 20 quarters for each period of time.

Control variables that I use at this analysis should not related to CSV determinants as I use in the previous section. Therefore, three variables are included to control for firm characteristics: 1) past dividends (PastDPR), the average of the last three years of dividend payout ratio; 2) liquidity (Liquidity), calculated as current assets dividend by current liabilities; 3) free cash flow (FCF), the ratio of free cash flow to the book value of total asset.

Secondly, I intend to study the industry influence on dividend policy whether dividend policy varies across industries. For that, the 400 firms are classified into 10 industries, as categorize by Bloomberg which are communication, consumer discretionary, consumer staple, energy, health care, industrial, materials real estate, technology, and utilities. Next, these firms are grouped into defensive industry and non-defensive industry. Defensive industry comprise business that are essential for human basic needs. As those goods are necessary to every household, the consumer will buy goods regardless of the changes in price. Thus, these firms have stable earnings regardless of economic fluctuations. On the other hand, non-defensive industries or cyclical industry is non-essential goods for basic needs. Defensive industry comprises of consumer staple, health care and utilities. Defensive industry is assigned as dummy variable taking the value of 1 if firm i is in defensive industry, and 0 otherwise. **Table 2** summarizes definition of the variables. **Table 6** illustrates the descriptive statistics of dividend policy.

Table 2

Variable definitions

Variable	**Symbol**	**Definition**
Dependent Variable		
Dividend Payout Ratio (DPR)	DPR	Annual total cash dividend paid in a given fiscal year divided by net income for a given year
Dividend-to-sales (DTS)	DTS	Annual total cash dividend paid scaled by total sales revenue for a given year
Dividend-to-total asset (DTA)	DTA	Annual total cash dividend paid scaled by total assets
Independent Variable		
Book capital structure volatility	BCSV	Standard deviation of book leverage ratio compute using 20 quarters. Book leverage = book value of long-term debt to total assets
Market capital structure volatility	MCSV	Standard deviation of market leverage ratio compute using 20 quarters. Market leverage = book value of long-term debt to market value of total assets, which is calculated as book value of total assets minus book value of equity plus market value of equity.
Control Variable		
Liquidity	Liquidity	Current Assets /Current Liabilities
Free cash flow	FCF	(Net income + interest expenses + depreciation + amortization - capital expenditure)/Book value of assets
Past dividend payout	PastDPR	The arithmetic average of dividend payout ratio of the last three years

3.2.2. Research Hypotheses

Like cash flow or earnings volatility, capital structure volatility can be viewed as risk in term of corporate financial status (Chong & Kim, 2019). High debt volatility is partly due to high volatility in operating and investing activities (Campbell & Rogers, 2018). Therefore, higher risk is expected to have a negative relationship with dividend payments. Thus, I hypothesize that

H4: Capital structure volatility has a negative significant effect to dividend policies.

Because defensive industry is defined as a firm produces necessary goods for consumer. These firms are secured business that deal with long-lasting products and can be operative in all economic situations, thus; they have stable earnings. Therefore, defensive firms should pay higher dividends than non-defensive firms.

H5: Defensive firms significantly pay higher dividends than non-defensive firms.

3.2.3. Model Specification

Firstly, to examine the relationship of CSV on dividend policies for all samples (To test H4). The study uses panel data technique as it improves the efficiency of the estimation by considering both cross-sectional and time-series data. I use three variables to measure firm's dividend payout policies: DPR, DTS and DTA. The key explanatory variable is CSV. Control variables are PastDPR, Liquidity and FCF. The regression form is as followed:

$$DIV_{it} = \beta_0 + \beta_1 CSV_{it} + \beta_2 PastDPR_{it} + \beta_3 Liquidity_{it} + \beta_4 FCF_{it} + \varepsilon_{it} \quad (2)$$

(where i denotes individual firms, t denotes time which is year, CSV is alternatively BCSV or MCSV, DIV is alternatively DPR, DTS or DTA)

Secondly, to analyze whether defensive industry pay higher dividends than cyclical industry. I then add defensive industry dummy to Eq. (2) and the equation is as followed:

$$DIV_{it} = \beta_0 + \beta_1 CSV_{it} + \beta_2 PastDPR_{it} + \beta_3 Liquidity_{it} + \beta_4 FCF_{it} + \beta_5 Defensive_i + \varepsilon_{it} \quad (3)$$

(where i denotes individual firms, t denotes time, CSV is alternatively BCSV or MCSV, DIV is alternatively DPR, DTS or DTA, and Defensive is the dummy variable taking 1 if particular firm belongs to defensive industry.)

Then, in order to examine whether dividend policy varies across industries. Kruskal-Wallis (KW) test in conducted to determine if there are statistically significant differences among groups. The null hypothesis is rejected if H-statistic is greater than $\chi^2_{(k-1,\alpha)}$, α the level of significance (Pandey, 2003). Finally, to analyze the relation between dividend policies and CSV for each of industries. The following equation is as conducted:

$$\mathrm{DIV}_{j,t} = \alpha_j + \sum_{j=1}^{10} \beta_{1,j}\mathrm{CSV}_{j,t} + \sum_{j=1}^{10} \beta_{2,j}\mathrm{PastDPR}_{j,t} + \sum_{j=1}^{10} \beta_{3,j}\mathrm{Liquidity}_{j,t} + \sum_{j=1}^{10} \beta_{4,j}\mathrm{FCF}_{j,t} + \varepsilon_{j,t} \quad (4)$$

(Where j is the number of cross-sectional units = 10 industries, t denotes time and CSV is alternatively BCSV or MCSV, DIV is alternatively DPR, DTS or DTA)

To decide what model is suitable for a panel data model. Firstly, is to test F-statistic to choose between pooled ordinary least squares (POLS) and fixed-effect model (FEM). Secondly, Breusch–Pagan tests help to decide whether POLS and random effect model (REM) is more appropriate. And finally, Hausman test is used to determine the more suitable model between REM and FEM. For the multicollinearity problem, the Variance Inflation Factor (VIF) will be used. In the case of autocorrelation that results from the correlated error terms of the same firm across years and heteroskedasticity problem robust standard error is employed to generates heteroscedasticity and autocorrelation consistent results.

4. Results

4.1. Capital Structure Volatility Determinants

4.1.1. Descriptive Statistics

Table 3 presents summary statistics of variables for the final sample of 4,791 observations and **Table 4** illustrates the mean and median values of leverage (Book leverage: BLEV and Market leverage: MLEV), BCSV and MCSV and firm-specific factors from all 10 industries during 2001 to 2020. As observed, the mean value of BLEV and MLEV is 10.99% and 9.77% respectively. The mean value of BCSV and MCSV is 4.19% and 4.12%. Panel B, shows that leverage ratios and CSV vary across industries, which utilities sector has the highest BLEV and MLEV (27.81% and 21.90%). And also has the highest mean value of BCSV and MCSV (7.07% and 6.27% respectively). Materials sector has the lowest mean of BLEV with 7.33%, whereas; technology sector has the lowest mean of MLEV with 5.36% and also has the lowest mean of BCSV and MCSV with 2.62% and 2.37% respectively. For the firm characteristic for each industry, it can be observed that energy industry has the largest firm size, while health care sector has the smallest mean value of firm size. Utilities sector has the highest mean value of profitability and with the value of 20.21%, while technology sector is the least profitable industry with 5.16%. Industry with the highest market-to-book ratio is communication with a value of 2.1077, while materials sector has the lowest market-to-book ratio of 1.1958. On average, utilities sector has the highest change in asset and materials sector has the lowest change in asset.

Table 3

Panel A: Variables descriptive statistic.

Variable	Min	Median	Mean	Max	Std	Obs.
BLEV	0.0000	0.0479	0.1099	4.0441	0.1641	4,791
MLEV	0.0000	0.0377	0.0977	0.8850	0.1273	4,791
BCSV	0.0000	0.0335	0.0419	0.4786	0.0428	4,791
MCSV	0.0000	0.0310	0.0412	0.3202	0.0425	4,791

Variable	Min	Median	Mean	Max	Std	Obs.
SIZE	4.6454	8.0762	8.2926	14.6266	1.4746	4,791
MB	0.1593	1.0932	1.3808	44.4166	1.3165	4,791
Profitability	0.0000	0.0355	0.1012	0.8857	0.1393	4,791
ASCHG	-0.8787	0.2808	0.7402	137.0165	4.0637	4,791

This table reports the number of observations, min, median, means, max and standard deviations for the variables used in this paper. The final sample consists of 4,791 observations for 436 firms during the 2001 - 2020 period. Variable definitions and sources are in **Table 1.**

All VIFs are lower than 1.2

Table 4

Panel B: Cross industry summary statistics of variables.

	BLEV	MLEV	BCSV	MCSV	SIZE	ASCHG	MB	PROFIT	Obs.
Total	0.1099 0.0479	0.0977 0.0377	0.0419 0.0335	0.0412 0.0310	8.2926 8.0762	1.3808 1.0932	0.1012 0.0355	0.7402 0.2808	4,791
Communi- cation	0.1009 0.1017	0.0686 0.0740	0.0410 0.0412	0.0301 0.0316	8.7001 8.5513	0.5559 2.1077	2.0611 0.0749	0.1575 0.5174	331
Consumer Discretionary	0.0486 0.1046	0.0209 0.0969	0.0367 0.0372	0.0207 0.0383	8.0433 8.0458	1.4848 1.3562	0.0045 0.0948	0.1963 0.5801	1,034
Consumer Staple	0.0232 0.0800	0.0178 0.0687	0.0275 0.0316	0.0245 0.0295	7.9960 8.2468	0.9874 1.4267	0.0148 0.0635	0.2133 0.5641	554
Energy	0.0271 0.1780	0.0177 0.1672	0.0177 0.0527	0.0167 0.0532	7.9528 10.2910	1.1271 1.3235	0.0144 0.1706	0.3348 0.5167	144
Health	0.1936 0.1039	0.1596 0.0592	0.0440 0.0432	0.0457 0.0341	10.9055 7.6231	1.1596 1.7898	0.1509 0.1030	0.3715 0.7973	215
Industrial	0.0873 0.0968	0.0416 0.0973	0.0327 0.0411	0.0197 0.0439	7.4307 8.1613	1.4328 1.2152	0.0519 0.1070	0.5124 0.5858	866
Materials	0.0412 0.0733	0.0377 0.0703	0.0307 0.0413	0.0323 0.0424	7.8644 8.2817	1.0379 1.1958	0.0406 0.0885	0.2528 0.3122	729
Real estate	0.0105 0.1699	0.0094 0.1656	0.0321 0.0600	0.0314 0.0607	8.0091 8.5399	1.0720 1.3038	0.0236 0.1522	0.2046 1.0506	524
Technology	0.1675 0.0977	0.1474 0.0536	0.0549 0.0262	0.0552 0.0237	8.6344 8.1205	1.0224 1.2723	0.1236 0.0516	0.5205 0.4571	241

	BLEV	MLEV	BCSV	MCSV	SIZE	ASCHG	MB	PROFIT	Obs.
Utilities	0.0294	0.0224	0.0218	0.0191	8.0963	1.1475	0.0177	0.2504	153
	0.2781	0.2190	0.0707	0.0627	8.8448	1.5394	0.2021	5.3671	

This table presents mean (median in parentheses) values of BLEV, MLEV, BCSV, MCSV and firm-specific variables from 10 industries. BLEV is book leverage ratio. MLEV is market leverage ratio. BSCV is the standard deviation of book leverage ratio compute using 20 quarters moving windows for each period. MCSV is the standard deviation of market leverage ratio compute using 20 quarters moving windows for each period. The variables are as follows. SIZE: Firm size defined as the natural logarithm of total book assets. PROFIT: Profitability defined as earnings before interest, taxes and depreciation scaled by total assets. MB: Market-to-book ratio is calculated by the market capitalization to book value of equity. ASCHG: Asset change is measured by the assets in 4th quarter of year n minus assets in 1st quarter in year n-5, scaled by assets in 1st quarter in year n-5. Obs. is the number of firms per industry

4.1.2. Empirical Findings

Table 5 presents the results of the relationship between firm-specific factors and capital structure volatility (Hypothesis H1 - H3). To ensure that the model is not affected by multicollinearity, Variance Inflation Factors (VIFs) is conducted and find that all the VIFs are lower than 1.2. Thus, multicollinearity problems should not be concerned. Column (1) and (2) report the results of firm-specific factors on BCSV and MCSV respectively. Fixed-effect model was used with robust standard error cluster by firms to correct serial correlation problems. The results show that profitability has significant positive impacts to both BCSV and MCSV at 1% significance level, suggesting that more profitable firms vary their capital structure more because these firms have more ability to repay the debt if they choose to issue new debt or they can use equity, (retained earnings) as they have higher profitability. Therefore, these firms likely to vary their capital structure more as they can bear more risk in changing their capital structure. Market-to-book ratio is positively related to BCSV and MCSV at 1% and 5% significant level respectively. Suggesting that firms with more growth opportunities vary their capital structure more, which is consistent with hypothesis 3. Asset change also has a significant positive effect to BCSV and MCSV with 1% significance level. Hence, firms that have a greater change in assets have more volatile capital structure. For MB and asset change factor, the results are in line, one explanation is that firms with high growth opportunities would need more fund therefore they asset would be increased in the future and when they finance for those fund needs, they use debt either or equity or use both debt and asset with the different portion, thus affect positively to CSV. Finally, size does not provide statistically results to CSV.

Table 5

Determinants of capital structure volatility.

	(1) BCSV	(2) MCSV
SIZE	-0.0032 (-1.60)	-0.0021 (-1.13)
ROA	0.0672*** (5.25)	0.0886*** (6.78)
MB	0.0020*** (2.59)	0.0009** (2.10)
ASCHG	0.0013*** (4.31)	0.0008*** (3.60)
Intercept	0.0582*** (3.45)	0.0478*** (3.10)
R-sq	0.0719	0.0920
Obs.	4,791	4,791
Model	FE	FE

This table reports the results of firm-specific variables on capital structure volatility (H1-H3) from Eq. (1) $CSV_{it} = \alpha + \beta_1 SIZE_{it-5} + \beta_2 MB_{it-5} + \beta_3 ROA_{it-5} + \beta_4 ASCHG_{it} + \varepsilon_{it}$. The dependent variable is BCSV and MCSV. The variables are as follows. SIZE: Firm size defined as the natural logarithm of total book assets. PROFIT: Profitability defined as earnings before interest, taxes and depreciation scaled by total assets. MB: Market-to-book ratio is calculated by the market capitalization to book value of equity. ASCHG: Asset change is measured by the assets in 4th quarter of year n minus assets in 1st quarter in year n-4, scaled by assets in 1st quarter in year n-4. **Table 1** defines all variables. The t-statistics and z-statistics are reported in parentheses. ***, **, and * represent 1%, 5%,

	(1) BCSV	(2) MCSV
and 10% significance levels with two-tailed tests. All VIFs are lower than 1.2.		

4.2. Capital structure volatility and dividend policy

4.2.1. Descriptive statistics

Table 6 presents the descriptive statistics of variables. There are 4,340 firm-year observations. Panel A shows the dividend payout ratio by year. The mean value of dividend payout ratios fluctuates over the sample period, the lowest payout ratio is in 2001 with 34.36% and the highest payout ratio is in 2013 with 141.91%. Compare to the median value of DPR, the value ranging between 15.53% and 60.54%, which is in 2001 and 2019 respectively. The standard deviation varies between 44.10% and 116.43%.

The significant variations in dividend payout ratio of each industry are testified by the K-W test in Panel A. For over 2001 – 2020, the result show that there is a statistically significant difference in dividend payout ratio across 10 industries, K-W χ^2 = 143.329, p = 0.0001. Thus, we reject the null hypothesis and conclude that DPR vary across industries over the studied period. When looking for each year the computed K-W χ^2 is significant most of the year in the studied period. Therefore, there is variation in dividend payout across industries. Except in the year 2001, 2004 and 2017 – 2020, that the results cannot be rejected the null hypothesis; thus, in recent years there is no evidence to conclude that dividend payout differs significantly in those years.

Panel B presents DPR by industry. As observed, industrial sector has the highest mean value of DPR with 102.09% and health sectors has the lowest mean of DPR with 50.57%. The standard deviation varies between 31.41% and 737.85% with health sectors has the lowest S.D. whereas, industrial sector has the highest S.D. of DPR. Panel C, presents the descriptive statistic of key explanatory variable and control variables. The mean value of BCSV is 4.38% and the median value is 3.45%. Whereas, MCSV has the higher mean value with 4.39% but lower median value with 3.17%. The mean and median value of FCF is 6.45% and 6.14% respectively. The mean and median value of past dividend payout (PastDPR) is 68.04% and 47.94%. The mean and median value of liquidity is 257.57% and 167.19% respectively.

Table 6

Descriptive statistics of DPR and variables.

Panel A: Dividend payout ratio for each year during the period 2001 - 2020

Year	Median	Mean	Std.	Obs.	K-Wχ^2
2001	0.1553	0.3436	0.5343	28	5.302
2002	0.3934	0.5385	0.7487	118	18.034**
2003	0.3936	0.4583	0.4517	155	22.224***
2004	0.4007	0.4781	0.4410	166	10.285
2005	0.4196	0.6268	1.7822	177	24.303***
2006	0.4755	0.7014	1.7786	176	16.213**
2007	0.4905	0.6870	0.9265	183	18.722**
2008	0.5036	0.8262	1.3276	190	20.908**
2009	0.4224	0.7403	1.7114	219	14.120**
2010	0.3837	0.4903	0.5110	262	25.585***
2011	0.5231	0.9226	4.2592	260	17.835**
2012	0.4082	0.5943	0.9983	267	20.720**
2013	0.4735	1.4191	11.6432	275	25.227***
2014	0.5021	0.6604	0.9671	260	28.060***
2015	0.4660	0.6374	0.8479	258	24.030***
2016	0.4619	0.6787	1.3077	271	20.238**
2017	0.5055	0.6609	0.9101	272	14.515
2018	0.5490	1.0717	3.2310	281	8.542
2019	0.6054	1.0045	2.2461	282	6.464
2020	0.5973	1.1203	3.0445	240	10.779
Total	0.4740	0.7772	3.4786	4,340	143.329***

This table reports the number of observations, min, median, means, max and standard deviations and K-Wχ^2 of dividend payout ratio across year. The final sample consists of 4,340 firm-year observations for 400 firms during the 2001 - 2020 period. The H-statistic is reported with ***, **, and * represent 1%, 5%, and 10% significance levels.

Panel B: Dividend payout ratio for each industry during the period 2001 - 2020

Industry	Median	Mean	Std.	Obs.
Communication	0.6731	0.8279	0.9008	303
Consumer Discretionary	0.4908	0.7143	1.3558	955
Consumer Staple	0.5522	0.8174	1.5056	586
Energy	0.4350	0.6023	0.6303	125
Health	0.4883	0.5057	0.3141	233
Industrial	0.4004	1.0209	7.3785	749
Materials	0.4329	0.7744	2.9624	662
Real estate	0.3539	0.6326	2.1349	372
Technology	0.5446	0.8252	1.9200	210
Utilities	0.5225	0.5664	0.5009	145
Total	0.4740	0.7772	3.4786	4,340

Panel C: Variables descriptive statistics

	Min	Median	Mean	Max	Std.	Obs.
BCSV	0.0000	0.0345	0.0438	0.4264	0.0465	4,340
MCSV	0.0000	0.0317	0.0439	0.3896	0.0482	4,340
FCF	-0.6765	0.0614	0.0645	1.0551	0.0782	4,340
PastDPR	0.0000	0.4794	0.6804	68.1306	2.1954	4,340
Liquidity	0.0413	1.6719	2.7557	218.1666	5.0129	4,340

This table reports the number of observations, min, median, means, max and standard deviations for the variables used in this section. The final sample consists of 4,340 firm-year observations for 400 firms during the 2001 - 2020 period. Variable definitions are in **Table 2.** All VIFs are lower than 1.1

Table 7 presents the correlation matrix of all variables. The three dividend policy measures, DPR, DTS and DTA, are all negatively related with key explanatory variable: BCSV and MCSV. Thus, from the correlation matrix, it can be indicated that CSV is associated with less dividend payment.

Table 7

Correlation Matrix

	DPR	DTS	DTA	BCSV	MCSV	FCF	PastDPR	Liquidity
DPR	1.0000							
DTS	0.0432	1.0000						
DTA	0.0624	0.5535	1.0000					
BCSV	-0.0159	-0.0293	-0.1914	1.0000				
MCSV	-0.0190	-0.0748	-0.2449	0.8949	1.0000			
FCF	-0.0503	0.2098	0.4504	-0.0460	-0.0686	1.0000		
PastDPR	0.0186	0.0146	0.0281	-0.0417	-0.0499	0.0118	1.0000	
Liquidity	-0.0018	0.0331	0.0317	-0.1362	-0.1126	0.0442	-0.0023	1.0000

4.2.2. Empirical Findings

Table 8 presents the analysis of the impact of book capital structure volatility (BCSV) on dividend policies. The Hausman statistics indicates that fixed-effect model is more appropriate. Therefore, fixed-effect model with robust standard error is employed to correct the heteroskedasticity and serial correlation problems. Column (1), Column (2) and Column (3) represents dividend payout ratio (DPR), dividend-to-sales (DTS) and dividend-to-assets (DTA) as a dependent variable respectively. The results indicate that coefficients of BCSV are negatively and statistically significant for DTS and DTA at 1% significance level (-0.1896, t=-3.07; and -0.1373, t=-6.12). This can be indicated that firms that have higher capital structure volatility are associated with less cash dividend than firms that have lower capital structure volatility. Based on the results, it can be concluded that capital structure volatility significantly effects dividend policy which is consistent with hypothesis 4 (H4). However, BCSV is insignificant to DPR.

The coefficients of control variables are generally consistent with the finding in the correlation matrix. FCF is positively significant to dividend policies (at 5% significance level for DTS and at 1% significance level for DTA). This is in line with many prior studies, as agency problems between managers and shareholders increase as FCF increases; thus, paying dividend can alleviate agency problems (Jensen and Meckling, 1976; Rozeff, 1982). On the contrary, FCF shows negative significant impact to DPR. Past dividend payout (PastDPR) does not show statistically significant to DPR and DTS, but negatively significant to DTA (at 10% significance level), indicating that current dividends and past dividends are in the opposite direction. Liquidity fails to provide statistically significant to all dividend policies.

Table 8

Impact of book capital structure volatility on dividend policies.

	(1) DPR	(2) DTS	(1) DTA
BCSV	-5.1730 (-1.62)	-0.1896*** (-3.07)	-0.1373*** (-6.12)
FCF	-3.5729*** (-5.58)	0.1408** (2.14)	0.1373*** (6.29)
PastDPR	-0.2238 (-2.77)	-0.0003 (-0.86)	-0.0005* (-1.79)
Liquidity	0.0025 (0.59)	0.0006 (1.37)	0.0001 (0.58)
Intercept	1.3796*** (6.88)	0.0579*** (19.9)	0.0369*** (26.15)
Obs.	4,340	4,340	4,340
R-sq	0.0236	0.0262	0.0982
Model	FE	FE	FE

This table reports the results of capital structure volatility on dividend policies from Eq. (2) $DIV_{it} = \beta_0 + \beta_1 CSV_{it} + \beta_2 PastDPR_{it} + \beta_3 Liquidity_{it} + \beta_4 FCF_{it} + \varepsilon_{it}$ The dependent variable is DPR, DTS and DTA. The main explanatory is book capital structure volatility (BCSV). **Table 2** defines all variables. The t-statistics are reported in parentheses, calculated based on robust standard errors clustered by firms. ***, **, and * represent 1%, 5%, and 10% significance levels with two-tailed tests.

Turning to MCSV, **Table 9** presents the analysis of the impact of market capital structure volatility (MCSV) on dividend policies by using fixed-effect model with robust standard error. Column (1), Column (2) and Column (3) represents dividend payout ratio (DPR), dividend-to-sales (DTS) and dividend-to-assets (DTA) respectively. The results show that coefficients of MCSV are all negatively significant to dividend policies. For DPR, significant at 10% level (-4.587, t=-1.71), for DTS and DTA are significant at 1% level (-0.1991, t=-3.10; -0.1148, t=-4.99). These results are consistent with BCSV on dividend policies, indicating that more volatile capital structure firms are likely to pay less dividends. For control variables results, FCF gives consistent results. DTS and DTA are positively related to FCF at 5% and 1% respectively; whereas DPR is negatively related to FCF. PastDPR is negatively related to DPR. Liquidity is insignificant to dividend policies.

Table 9

Impact of market capital structure volatility (MCSV) on dividend policies

	(1) DPR	(2) DTS	(3) DTA
MCSV	-4.5487* (-1.71)	-0.1991*** (-3.10)	-0.1148*** (-4.99)
FCF	-3.5673*** (-5.56)	0.1414** (2.14)	0.1374*** (6.27)
PastDPR	-0.2229*** (-2.80)	-0.0003 (-0.93)	-0.0005 (-1.63)
Liquidity	0.0027 (0.63)	0.0006 (1.38)	0.0001 (0.63)
Intercept	1.3514*** (7.64)	0.0583*** (19.49)	0.03585*** (24.58)
Obs.	4,340	4,340	4,340
R-sq	0.0232	0.0277	0.0938
Model	FE	FE	FE

This table reports the results of capital structure volatility on dividend policies from Eq. (2) $DIV_{it} = \beta_0 + \beta_1 CSV_{it} + \beta_2 PastDPR_{it} + \beta_3 Liquidity_{it} + \beta_4 FCF_{it} + \varepsilon_{it}$ The dependent variable is DPR, DTS and

DTA. The main explanatory is market capital structure volatility (MCSV). **Table 2** defines all variables. The t-statistics are reported in parentheses, calculated based on robust standard errors clustered by firms. ***, **, and * represent 1%, 5%, and 10% significance levels with two-tailed tests.

Table 10 presents the results of BCSV on dividend policies with defensive industry dummy. The results show that BCSV coefficients are negatively related to dividend policies, which is consistent with no defensive industry dummy in Eq. (2). The coefficients of defensive industry dummy show positive significant to DTS and DTA with 1% significance level respectively (0.0279, t=3.12; 0.0163, t=5.26). This can be implied that defensive industry pays 2.79% dividend higher than non-defensive industry for DTS, and pay 1.63% higher for DTA. One explanation is that defensive industry has stable earnings regardless of economic conditions. Thus, the defensive industry pays higher dividend. For control variables, most of coefficient gives consistent results with no defensive industry dummy equation.

Table 10

Impact of book capital structure volatility on dividend policies with defensive industry dummy.

	(1) DPR	(2) DTS	(3) DTA
BCSV	-1.3361 (-1.17)	-0.1717*** (-5.19)	-0.1544*** (-10.68)
FCF	-2.2709*** (-3.36)	0.1542*** (9.40)	0.1640*** (22.48)
PastDPR	0.0292** (1.22)	-0.0001 (-0.23)	-0.0004 (-1.43)
Liquidity	-0.0015 (-0.14)	0.0006** (2.20)	0.0000 (0.40)
Defensive	-0.0521 (-0.45)	0.0279*** (3.12)	0.0163*** (5.26)
Intercept	0.9817*** (9.80)	0.0468*** (9.19)	0.0298*** (16.17)
Obs.	4,340	4,340	4,340

Model	POLS	RE	RE
R-sq	0.0033	0.0487	0.2431

This table reports the results of book capital structure volatility (BCSV) and defensive dummy variable on dividend policies from Eq. (3) $\mathbf{DIV_{it}} = \beta_0+\beta_1\mathrm{CSV_{it}}+\beta_2\mathrm{PastDPR_{it}}+\beta_3\mathrm{Liquidity_{it}}+\beta_4\mathrm{FCF_{it}}+\beta_5\mathrm{Defensive_{it}}+\varepsilon_{it}$. **Table 2** defines all variables. The t-statistics and z-statistics are reported in parentheses, calculated based on robust standard errors clustered by firms. ***, **, and * represent 1%, 5%, and 10% significance levels with two-tailed tests.

Table 11 presents the results of MCSV on dividend policies with defensive industry dummy. The results reveals that all MCSV coefficients are negatively related to dividend policies, which is consistent with no defensive industry dummy in Eq. (2). The coefficients of defensive industry dummy show positive significant to DTS and DTA with 5% significance level and 1% significance level respectively (0.0265, t= 2.95; 0.0152, t= 5.00). This can be indicated that defensive industry pays more dividend than non-defensive industry. For DTS, defensive industry pays 2.65% higher and pay 1.52% higher for DTA. For control variables, all of coefficient gives consistent results with no defensive industry dummy in Eq (2) except for the coefficient of PastDPR of DPR, which is significantly positive related to DPR.

Table 11

Impact of market capital structure volatility on dividend policies with defensive industry dummy.

	(1) DPR	(2) DTS	(3) DTA
MCSV	-1.6161*** (-2.69)	-0.1914*** (-6.04)	-0.1450*** (-10.45)
FCF	-2.3007*** (-6.01)	0.1544*** (9.42)	0.1649*** (22.56)
PastDPR	0.0287** (2.11)	-0.0002 (-0.29)	-0.0003 (-1.37)
Liquidity	-0.0015	0.0006**	0.0000

	(-0.32)	(2.18)	(0.41)
Defensive	-0.0622 (-0.79)	0.0265*** (2.95)	0.0152*** (5.00)
Intercept	0.9995*** (12.03)	0.0480*** (9.45)	0.0295*** (16.23)
Obs.	4,340	4,340	4,340
Model	POLS	RE	RE
R-sq	0.0034	0.0541	0.2594

This table reports the results of MCSV and defensive dummy variable on dividend policies from Eq. (3) $DIV_{it} = \beta_0+\beta_1 CSV_{it}+\beta_2 PastDPR_{it}+\beta_3 Liquidity_{it}+\beta_4 FCF_{it}+\beta_5 Defensive_{it}+\varepsilon_{it}$. **Table 2** defines all variables. The t-statistics and z-statistics are reported in parentheses, calculated based on robust standard errors clustered by firms. ***, **, and * represent 1%, 5%, and 10% significance levels with two-tailed tests.

All VIFs are lower than 1.1

Table 12 provides the estimation of the model for the samples of each industry individually for the 2001 – 2020 period. Hausman and Breusch-Pagan Lagrangian test are used to choose the appropriate model for each industry, and the model using is reported in the table. In this step, DTA is used as a proxy for dividend policy as its R-square from previous results provide the highest value.

Panel A show that most of BCSV coefficients are negatively significant to DTA except for three industries (Consumer Discretionary, Health care, and Industrial). Similarly, Panel B shows that most of MCSV coefficients are negatively and significantly impact DTA, except for three industries (Consumer Discretionary, Consumer Staple, and Health care). Therefore, both BCSV and MCSV do have negative significant explanatory impacts on DTA and thus, those industries, except health care and consumer discretionary are likely to pay less dividend due to capital structure volatility. The coefficients of FCF are highly positive significant to almost industries except energy and real estate sector, imply that the greater level of FCF, the higher dividend payments. However, PastDPR and Liquidity coefficients do not provide consistent results across industries. For Panel A, PastDPR of consumer staple, materials and technology sectors are negatively relevant to DTA, indicating past dividends and current dividends are in the opposite site for these industries. And for other industries, its current dividends and past dividend are not related.

Table 12

Impacts of capital structure volatility on dividend to total assets across industries

Panel A: Book capital structure volatility.

DTA	BCSV	FCF	PastDPR	Liquidity	Intercept	Obs.	R-sq	Model
Communi-cation	-0.2922* (-1.96)	0.4064*** (4.23)	-0.0002 (-0.02)	-0.0005 (-0.56)	0.0520*** (3.74)	303	0.3098	FE
Consumer Discretionary	-0.0805 (-1.53)	0.1376*** (5.11)	0.0002 (0.19)	-0.0014* (-1.67)	0.0381*** (11.99)	955	0.1032	FE
Consumer Staple	-0.1526*** (-3.61)	0.1972*** (3.09)	-0.0082*** (-3.51)	0.0019 (1.52)	0.0426*** (10.82)	586	0.1972	FE
Energy	-0.0623*** (-3.43)	-0.0061 (-1.00)	0.0004* (1.89)	0.0001 (0.06)	0.0323*** (5.06)	125	0.0699	RE
Health care	-0.0940 (-1.61)	0.0371* (1.86)	0.0319** (2.13)	0.0025 (1.01)	0.0260** (2.81)	233	0.2242	FE
Industrial	-0.0586 (-1.02)	0.0925** (2.41)	0.0000 (0.18)	0.0003 (0.79)	0.0257*** (9.13)	749	0.0562	FE
Materials	-0.1774** (-2.63)	0.1243*** (3.91)	-0.0010* (-1.93)	0.0032*** (2.70)	0.0311*** (7.95)	662	0.1293	FE
Real Estate	-0.0668*** (-3.26)	-0.0185 (-1.47)	-0.0009 (-0.91)	0.0005** (2.01)	0.0229*** (12.23)	372	0.0451	FE
Technology	-0.1859*** (-2.95)	0.1504*** (3.23)	-0.0042* (-1.89)	-0.0015 (-0.84)	0.0412*** (5.31)	210	0.0525	RE
Utilities	-0.0462** (-2.15)	0.1003*** (4.49)	-0.0003 (-0.39)	0.0000 (0.34)	0.0277*** (4.62)	145	0.1972	RE

Panel B: Market capital structure volatility.

DTA	MCSV	FCF	PastDPR	Liquidity	Intercept	Obs.	R-sq	Model
Communi-cation	-0.3267** (-2.33)	0.4103*** (4.38)	-0.0014 (-0.16)	-0.0004 (-0.47)	0.0507*** (4.33)	303	0.3099	FE
Consumer Discretionary	-0.0544 (-1.12)	0.1375*** (5.07)	0.0002 (0.26)	-0.0014 (-1.63)	0.0370*** (11.79)	955	0.1001	FE
Consumer Staple	-0.0985 (-1.51)	0.2007*** (3.07)	-0.0086*** (-3.47	0.0020 (1.61)	0.0403*** (8.94)	586	0.1817	FE
Energy	-0.0950*** (-4.22)	-0.0014 (-0.21)	0.0005** (2.22)	0.0003 (0.14)	0.0335*** (5.00)	125	0.1088	RE
Health care	0.0006 (0.01)	0.0423* (1.92)	0.0412** (2.33)	0.0039 (1.31)	0.0145 (1.20)	233	0.1951	RE
Industrial	-0.1023** (-2.11)	0.0943** (2.49)	0.0000 (-0.20)	0.0003 (0.74)	0.0278*** (10.68)	749	0.0659	FE
Materials	-0.1513** (-2.24)	0.1214*** (3.89)	-0.0010* (-1.96)	0.0034*** (2.82)	0.0300*** (7.62)	662	0.1223	FE
Real Estate	-0.0787*** (-4.15)	-0.0201 (-1.61)	-0.0011 (-1.07)	0.0005** (1.97)	0.0240*** (12.96)	372	0.0632	FE
Technology	-0.2074*** (-3.93)	0.1418*** (3.24)	-0.0045* (-2.00)	-0.0017 (-0.95)	0.0430*** (5.81)	210	0.0598	FE
Utilities	-0.1175** (-2.23)	0.0956*** (4.96)	-0.0004 (-0.56)	0.0000 (0.45)	0.0368*** (11.43)	145	0.3599	FE

This table reports the results of capital structure volatility on DTA across industries from Eq. (4) $DIV_{j,t} = \alpha_j + \sum_{j=1}^{10} \beta_{1,j} BCSV_{j,t} + \sum_{j=1}^{10} \beta_{2,j} PastDPR_{j,t} + \sum_{j=1}^{10} \beta_{3,j} Liquidity_{j,t} + \sum_{j=1}^{10} \beta_{4,j} FCF_{j,t} + \varepsilon_{j,t}$ The dependent variable is DTA. The main explanatory variables are BCSV and MCSV. **Table 2** defines all variables. The t-statistics and z-statistics are reported in parentheses. ***, **, and * represent 1%, 5%, and 10% significance levels with two-tailed tests.

5. Conclusion

According to trade-off theory, which firms have the target capital structure and their try to maintain the capital structure. Contrary to trade-off theory, the firms in Thailand have varied their capital structure over time. In this paper, I attempt to examine the determinants of a firm’s capital structure volatility in Thai-listed firms instead of the prior studies which try to determine the factors affecting the level of corporate leverage. I find that the impacts of firm-specific factors like, market-to-book ratio, profitability and change in assets on the volatility of capital structure are significant. The results suggest that firms with more volatile capital structure tend to be more profitable, have more growth opportunities, and have a greater change in assets.

Turning to the impacts of CSV on dividend policies, the results show that CSV is negatively significant to all dividend policies; namely dividend payout ratio, dividend-to-sales, and dividend-to-assets. Firms with higher volatility in their capital structure are associated with fewer dividend payments. Based on these findings, CSV can be viewed as a risk in term of corporate financial statuses like cash flow volatility or earnings volatility. That is firm has unstable capital structure; thus, has negative effects to firm’s dividend policies. And this factor should be considered as one of the determinants of dividend payments when firm determine their dividends.

In addition, I also examine the variation in the dividend policy across ten industries in Thai firms. the results suggest that there is a variation dividend policy across sectors during the studied period. Therefore, industry effect influences the dividend payments in Thai firms. Moreover, CSV factor do negatively impact dividend policy for almost all 10 industries except health care and consumer discretionary. Therefore, CSV is one of the main factors that affects dividend payments. Other factors, such as FCF shows positive significant impacts on dividend policy to most of all industries. Finally, the results confirm that the defensive industry pays higher dividends than the non-defensive industry.

For the implication of this study, studying CSV's effects on dividend payments can be a useful guideline for analysts, investors, and practitioners to better understanding on firm's dividend payments. Apart from past literature that focus on number of factors that influence dividend payment, CSV do have impact on dividend policies. The results can help analysts and investors to forecast dividend payment more accurately along with other factors. Moreover, the findings can also be a guideline for investors who have preference to invest in stable dividend payments, they thus should invest in defensive firms as results suggested.

Appendix

Table 13 and **Table 14** show the impacts of CSV on DPR and DTS respectively. For table 13, BCSV impacts negatively to DPR only energy and technology sector; whereas, MCSV impacts negatively to DPR for half of all industries (Communication, Consumer discretionary, Consumer staple, Energy and Technology). Turning to Table 14, BCSV and DTS are negative significant related to half of industries (Consumer staple, Energy, Health care, Real estate and Technology). MCSV and DTS are negative significant related half of industries as well (Communication, Consumer Staple, Energy, Industrial, and Technology). This can be implied that consumer staple, energy, and technology are affected by CSV when determining dividend payment (for both DPR and DTS).

Table 13

Impact of CSV on DPR across industries.

Panel A: Impact of book capital structure volatility (BCSV) on dividend payout ratio (DPR).

DPR	BCSV	FCF	PastDPR	Liquidity	Intercept	Obs.	R-sq	Model
Communi-cation	-1.4588 (-0.70)	-0.7766 (-1.10)	0.2056 (1.51)	-0.0204*** (-3.64)	0.8604*** (5.57)	303	0.0382	RE
Consumer Discretionary	-2.2099 (-1.50)	-3.1339*** (-2.81)	0.0370 (0.20)	-0.0023 (-0.13)	0.9813*** (9.09)	955	0.0298	FE
Consumer Staple	-2.0415 (-1.52)	-4.5986*** (-3.13)	-0.2880*** (-4.13)	0.0471 (1.06)	1.2862*** (9.19)	586	0.0594	FE
Energy	-1.8633*** (-4.64)	-1.0940 (-1.49)	-0.0007 (-0.15)	-0.0116 (-0.15)	0.8159*** (3.78)	125	0.1007	RE
Health care	-0.2792 (-0.65)	-0.7604*** (-3.75)	0.5749*** (9.56)	0.0398** (2.09)	0.2734*** (5.69)	233	0.2485	RE
Industrial	-27.0503 (-1.1)	-5.2426** (-2.13)	-0.3600*** (-7.97)	0.0101 (0.53)	2.6939** (2.53)	749	0.0402	FE
Materials	-2.7477 (-1.02)	-5.9838** (-2.41)	-0.0773*** (-8.27)	-0.0125 (-0.28)	1.4332*** (3.66)	662	0.0214	FE
Real Estate	-0.6802 (-0.20)	-5.6227*** (-3.69)	-0.2650*** (-5.30)	0.0275 (1.44)	0.9913*** (5.23)	372	0.0289	FE
Technology	-3.0467**	-3.4784***	-0.1010**	0.0024	1.2247***	210	0.0201	RE

DPR	BCSV	FCF	PastDPR	Liquidity	Intercept	Obs.	R-sq	Model
	(-1.97)	(-3.82)	(-2.23)	(0.23)	(7.07)			
Utilities	-1.1876 (-1.38)	0.3435 (0.93)	0.0514*** (2.80)	-0.0012*** (-2.59)	0.6071*** (4.23)	145	0.1083	RE

Panel B: Impact of market capital structure volatility (MCSV) on dividend payout ratio (DPR).

DPR	MCSV	FCF	PastDPR	Liquidity	Intercept	Obs.	R-sq	Model
Communi-cation	-3.4949** (-2.18)	-0.9279 (-1.26)	0.1759 (1.42)	-0.0222*** (-3.59)	0.9480*** (6.44)	303	0.0484	RE
Consumer Discretionary	-1.8061* (-1.75)	-3.1317*** (-2.77)	0.0373 (0.20)	-0.0016 (-0.09)	0.9672*** (8.91)	955	0.0293	FE
Consumer Staple	-4.1531*** (-3.49)	-4.4100 (-3.03)	-0.3108 (-4.01)	0.0451 (1.01)	1.3615*** (8.52)	586	0.0638	FE
Energy	-2.0649*** (-3.32)	-1.0555 (-1.38)	0.0008 (0.15)	-0.0070 (-0.09)	0.8119*** (3.78)	125	0.0993	RE
Health care	0.1107 (0.53)	-0.7414*** (-3.62)	0.6138*** (9.29)	0.0455** (2.32)	0.2284*** (5.48)	233	0.2443	RE
Industrial	-19.3699 (-1.10)	-5.4279 (-2.46)	-0.3452 (-10.73)	0.0063 (0.31)	2.4252*** (2.92)	749	0.0365	FE
Materials	-2.1504 (-0.67)	-6.0310** (-2.40)	-0.0768*** (-8.16)	-0.0087 (-0.19)	1.4057*** (3.38)	662	0.0211	FE
Real Estate	0.5357 (0.20)	-5.6112*** (-3.68)	-0.2524*** (-4.71)	0.0266 (1.44)	0.9081*** (5.74)	372	0.0289	FE
Technology	-3.2542** (-2.45)	-3.6155*** (-3.99)	-0.1062** (-2.40)	0.0020 (0.20)	1.2426*** (7.42)	210	0.0210	RE
Utilities	-0.6699 (-1.06)	0.3524 (1.00)	0.0386** (2.54)	-0.0007** (-2.06)	0.5695*** (4.54)	145	0.0835	RE

This table reports the results of capital structure volatility on DPR across industries from Eq. (4) $DIV_{j,t} = \alpha_j + \sum_{j=1}^{10} \beta_{1,j} BCSV_{j,t} + \sum_{j=1}^{10} \beta_{2,j} PastDPR_{j,t} + \sum_{j=1}^{10} \beta_{3,j} Liquidity_{j,t} + \sum_{j=1}^{10} \beta_{4,j} FCF_{j,t} + \varepsilon_{j,t}$ The dependent variable is DPR. The main explanatory variables are BCSV and MCSV. **Table 2** defines all variables. The t-statistics and z-statistics are reported in parentheses. ***, **, and * represent 1%, 5%, and 10% significance levels with two-tailed tests.

Table 14

Impact of CSV on DTS across industries

Panel A: Impact of book capital structure volatility (BCSV) on dividend to sales (DTS).

DTS	BCSV	FCF	PastDPR	Liquidity	Intercept	Obs.	R-sq	Model
Communi-cation	-0.5536 (-1.34)	0.8436*** (5.73)	0.0338 (1.58)	-0.0020 (-0.42)	0.0655 (1.42)	303	0.1629	RE
Consumer Discretionary	-0.0199 (-0.20)	0.0593** (2.18)	-0.0001 (-0.14)	-0.0006 (-0.55)	0.0564*** (10.47)	955	0.0078	FE
Consumer Staple	-0.1590** (-2.11)	0.0313 (0.60)	-0.0048** (-2.58)	0.0030*** (4.31)	0.0444*** (7.65)	586	0.0681	FE
Energy	-0.0423*** (-4.78)	-0.0061 (-0.92)	-0.0003 (-1.52)	0.0006 (0.67)	0.0320*** (2.78)	125	0.0611	RE
Health care	-0.1178* (-1.79)	0.0023 (0.09)	0.0471*** (3.16)	0.0045* (1.73)	0.0345*** (2.72)	233	0.2125	RE
Industrial	-0.0716 (-0.74)	0.0607 (1.32)	0.0001 (0.28)	0.0019 (1.33)	0.0398*** (7.40)	749	0.0207	FE
Materials	-0.0875 (-1.35)	0.0499* (1.88)	-0.0009 (-1.57)	0.0067*** (5.56)	0.0251*** (5.74)	662	0.1134	FE
Real Estate	-0.2024* (-1.90)	-0.1245* (-1.90)	-0.0050 (-0.96)	0.0023* (1.69)	0.0868*** (8.90)	372	0.0274	FE
Technology	-0.1233*** (-3.14)	0.0850* (1.95)	- 0.0037*** (-3.00)	-0.0015 (-0.93)	0.0747** (2.06)	210	0.0012	RE
Utilities	-0.0462 (-0.32)	0.2444*** (3.37)	-0.0039** (-2.45)	0.0001 (0.60)	0.1168*** (10.49)	145	0.2156	FE

Panel B: Impact of market capital structure volatility (MCSV) on dividend to sales (DTS).

DTS	MCSV	FCF	PastDPR	Liquidity	Intercept	Obs.	R-sq	Model
Communi-cation	-0.9208** (-2.01)	0.8285*** (5.69)	0.0270 (1.24)	-0.0018 (-0.39)	0.0766* (1.70)	303	0.1567	RE
Consumer Discretionary	0.0105 (0.12)	0.0588** (2.14)	-0.0000 (-0.04)	-0.0006 (-0.53)	0.0550*** (10.49)	955	0.0077	FE
Consumer Staple	-0.1497* (-1.77)	0.0372 (0.74)	-0.0055*** (-2.69)	0.0031*** (4.41)	0.0438*** (7.18)	586	0.0607	FE
Energy	-0.0586*** (-4.53)	-0.0038 (-0.56)	-0.0002 (-1.40)	0.0007 (0.79)	0.0325*** (2.81)	125	0.1305	RE
Health care	-0.0589 (-1.58)	-0.0192 (-0.74)	0.0436** (2.56)	0.0087*** (3.27)	0.0267** (2.56)	233	0.1727	FE

DTS	MCSV	FCF	PastDPR	Liquidity	Intercept	Obs.	R-sq	Model
Industrial	-0.3011**	0.0694	-0.0002	0.0017	0.0499***	749	0.0440	FE
	(-2.05)	(1.60)	(-0.68)	(1.36)	(7.93)			
Materials	-0.0920	0.0488*	-0.0009	0.0067***	0.0254***	662	0.1144	FE
	(-1.26)	(1.87)	(-1.60)	(5.66)	(5.45)			
Real Estate	-0.1285	-0.1269**	-0.0043	0.0022	0.0825***	372	0.0217	FE
	(-1.43)	(-2.07)	(-0.70)	(1.01)	(7.46)			
Technology	-0.1642***	0.0803**	-0.0040***	-0.0017	0.0768**	210	0.0005	RE
	(-2.59)	(1.99)	(-3.28)	(-1.15)	(2.13)			
Utilities	-0.1185	0.2488***	-0.0028**	0.0000	0.1084***	145	0.1283	RE
	(-0.83)	(3.54)	(-2.32)	(0.29)	(4.09)			

This table reports the results of capital structure volatility on DTS across industries from Eq. (4) $DIV_{j,t} = \alpha_j + \sum_{j=1}^{10} \beta_{1,j} BCSV_{j,t} + \sum_{j=1}^{10} \beta_{2,j} PastDPR_{j,t} + \sum_{j=1}^{10} \beta_{3,j} Liquidity_{j,t} + \sum_{j=1}^{10} \beta_{4,j} FCF_{j,t} + \varepsilon_{j,t}$ The dependent variable is DTS. The main explanatory variables are BCSV and MCSV. **Table 2** defines all variables. The t-statistics and z-statistics are reported in parentheses. ***, **, and * represent 1%, 5%, and 10% significance levels with two-tailed tests.

REFERENCES

Abdeljawad, I., Nor, F., Ibrahim, I., & Abdul Rahim, R. (2013). Dynamic Capital Structure Trade-off Theory: Evidence from Malaysia. *International Review of Business Research Papers*, *9*, 102-110.

Aggarwal, R., & Kyaw, N. A. (2010). Capital structure, dividend policy, and multinationality: Theory versus empirical evidence. *International Review of Financial Analysis*, *19*(2), 140-150.

Baker, H. K., Singleton, J.C., & Veit, E.T.,. (2011). Survey Research in Corporate Finance. *Oxford University Press*.

Barros, V., Verga Matos, P., & Miranda Sarmento, J. (2020). What firm's characteristics drive the dividend policy? A mixed-method study on the Euronext stock exchange. *Journal of Business Research*, *115*, 365-377.

Campbell, G., & Rogers, M. (2018). Capital structure volatility in Europe. *International Review of Financial Analysis*, *55*, 128-139.

Chong, B.-U., & Kim, H. (2019). Capital structure volatility, financial vulnerability, and stock returns: Evidence from Korean firms. *Finance Research Letters*, *30*, 318-326.

Cook, D. O., Fu, X., & Tang, T. (2016). Are target leverage ratios stable? Investigating the impact of corporate asset restructuring. *Journal of Empirical Finance*, *35*, 150-168.

de Jong, A., Kabir, R., & Nguyen, T. T. (2008). Capital structure around the world: The roles of firm- and country-specific determinants. *Journal of Banking & Finance*, *32*(9), 1954-1969.

de Jong, A., Verbeek, M., & Verwijmeren, P. (2011). Firms' debt–equity decisions when the static tradeoff theory and the pecking order theory disagree. *Journal of Banking & Finance*, *35*(5), 1303-1314.

Denis, D. J., & Osobov, I. (2008). Why do firms pay dividends? International evidence on the determinants of dividend policy. *Journal of Financial Economics*, *89*(1), 62-82.

Fama, E. F., & Babiak, H. (1968). Dividend Policy: An Empirical Analysis. *Journal of the American Statistical Association*, *63*(324), 1132-1161.

Fama, E. F., & French, K. R. (2001). Disappearing dividends: changing firm characteristics or lower propensity to pay? *Journal of Financial Economics*, *60*(1), 3-43.

Fischer, E. O., Heinkel, R., & Zechner, J. (1989). Dynamic Capital Structure Choice: Theory and Tests. *The Journal of Finance*, *44*(1), 19-40.

Gordon, M. J. (1962). The Savings Investment and Valuation of a Corporation. *The Review of Economics and Statistics*, *44*(1), 37-51.

Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: evidence from the field. *Journal of Financial Economics*, *60*(2), 187-243.

Hovakimian, A., Hovakimian, G., & Tehranian, H. (2004). Determinants of target capital structure: The case of dual debt and equity issues. *Journal of Financial Economics*, *71*(3), 517-540.

Im, H. J., Kang, Y., & Shon, J. (2020). How does uncertainty influence target capital structure? *Journal of Corporate Finance*, *64*, 101642.

Jabbouri, I. (2016). Determinants of corporate dividend policy in emerging markets: Evidence from MENA stock markets. *Research in International Business and Finance*, *37*, 283-298.

Jalilvand, A., & Harris, R. S. (1984). Corporate Behavior in Adjusting to Capital Structure and Dividend Targets: An Econometric Study. *The Journal of Finance*, *39*(1), 127-145.

Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *The American Economic Review*, *76*(2), 323-329.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305-360.

Kaźmierska-Jóźwiak, B. (2015). Determinants of Dividend Policy: Evidence from Polish Listed Companies. *Procedia Economics and Finance*, *23*, 473-477.

Leary, M. T., & Roberts, M. R. (2005). Do Firms Rebalance Their Capital Structures? *The Journal of Finance*, *60*(6), 2575-2619.

Li, L., & Islam, S. Z. (2019). Firm and industry specific determinants of capital structure:

Evidence from the Australian market. *International Review of Economics & Finance*, *59*, 425-437.

Lintner, J. (1956). Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes. *The American Economic Review*, *46*(2), 97-113.

Michel, A. (1979). Industry Influence on Dividend Policy. *Financial Management*, *8*(3), 22-26.

Miller, M. H., & Rock, K. (1985). Dividend Policy under Asymmetric Information. *The Journal of Finance*, *40*(4), 1031-1051.

Modigliani, F., & Miller, M. H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review*, *48*(3), 261-297.

Modigliani, F., & Miller, M. H. (1963). Corporate Income Taxes and the Cost of Capital: A Correction. *The American Economic Review*, *53*(3), 433-443.

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, *5*(2), 147-175.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187-221.

Pandey, I. M. (2003). Corporate dividend policy behaviour and: The Malaysian evidence. *Asian Academy of Management Journal*, *8*.

Pinto, G., & Rastogi, S. (2019). Sectoral Analysis of Factors Influencing Dividend Policy: Case of an Emerging Financial Market. *Journal of Risk and Financial Management*, *12*, 110.

Rozeff, M. S. (1982). Growth, Beta and Agency Costs as Determinants of Dividend Payout Ratios. *Journal of Financial Research*, *5*(3), 249-259.

Tekin, H., & Polat, A. Y. (2020). Do market differences matter on dividend policy? *Borsa Istanbul Review*.

Xu, J., & Huang, H. (2021). Pay more or pay less? The impact of controlling shareholders' share pledging on firms' dividend payouts. *Pacific-Basin Finance Journal*, *65*, 101493.

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