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IMPACT OF CHANGE IN REFINANCING RISK ON RETENTION AND PAYOUT RATIOS

Harvinder Singh

Associate Professor
Department of Commerce, University College, Benra (Dhuri)

ABSTRACT:

The current study uses a correlational research design to investigate the impact of corporate debt refinancing risk (*ΔCD_RFR*) on the change in retention ratio and cash dividend payout ratio.The COMPUSTAT of Wharton Research Data Services provided data on American publicly traded firms from 2014 to 2023.This study used ordinary least square regressions to estimate the results from the panel data.Data analysis shows that *ΔCD_RFR* increases the plowback ratio and decreases the payout ratio.Empirical research also shows that *ΔCD_RFR* encourages American publicly traded firms to reduce debt leverage in the capital structure and have an optimal capital structure to maximize shareholders' wealth. Analysis also shows that changes in corporate debt leverage moderate the association between refinancing risk, dividend payout, and retention ratio. The current study adds to the literature on the association of refinancing risk with the plowback and payout ratios and thus may help investors make stock investment decisions and financial management consultants to provide consulting services.

Keywords: Corporate debt refinancing risk, retention ratio, cash dividend payout ratio, American firms

1 INTRODUCTION

Corporate debt refinancing risk is among the crucial challenges for American firms (Gill, Amiraslany, Obradovich, and Mathur, 2019), forcing dividend payout and retention ratio adjustments. Harford, Klasa, and Maxwell (2014) show that debt refinancing risk is the possibility that corporate borrowers will be unable to replace their existing debt financing with new debt financing. In addition, short maturity of debt increases refinancing risk significantly because capital suppliers can decline the new debt. Debt is part of Modigliani and Miller's (1958) capital structure theory.

Dividend payout theory development goes back to Miller and Modigliani (1961). Lintner (1956) noted that dividend smoothing is typical for most firms because dividend cuts are a negative signal in the market. Black (1976) also asked a question related to dividend payout, "Why do firms pay dividends?" However, credit rating downgrades compelfirms to adjust dividend payout (Panagiotis, Stylianos, and Aichen, 2021) and pressure corporations to increase the retention ratio as a cushion. The retention ratio (i.e., plowback ratio) is the proportion of earnings firms retain (Canessa and Jarrell, 2022) to restructure capital structure.

Although refinancing risks enforce firms to cut back on dividend payouts, managers are reluctant to send a negative signal through dividend cuts, and the firms are willing to bear significant costs by avoiding cash dividend cuts (Panagiotis et al., 2021). Spence (1973) developed the signalling theory based on the belief that the management has better information on the firm's financial health than the market participants, leading to agency conflict between the firm and new shareholders.The agency theory showed that persistent dividend payout disciplines the managers and avoids conflict between the management and

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shareholders. However, higher smoothing of dividend payout increases external financing needs to meet financing requirements (Easterbrook, 1984; Jensen, 1986), increasing debt leverage. Besides, the high payout ratio can lead to asymmetric information related to wealth transfer from bondholders to shareholders if the firm uses external borrowings to pay dividends (Panagiotis et al., 2021). Firms try to circumvent the conflict between bondholders and shareholdersthrough large payouts to shareholders (Fama and Jensen, 1983). Therefore, bondholders may add necessary debt covenants and clauses on the bond contracts to minimize payouts and increase the retention ratio (John and Kalay, 1982).

A study by Banerjee and De (2015) tested the association of capital structure with decisions on the dividend payout ratio and reported that financial leverage significantly and positively influences the payout ratio. Harford, Klasa, and Maxwell (2014) investigated the association between refinancing risk and cash holdings and noted that corporate debt refinancing risk is crucial in determining corporate cash holdings. Another study by Gill, Amiraslany, Obradovich, and Mathur (2019) reported a negative correlation between refinancing risk and debt leverage. A negative correlation between refinancing risk and debt leverage indicates that refinancing risk compels firms to increase the retention ratio and decrease the payout ratio. Wrightsman and Horrigan (1975) argued that the theory of optimal earnings retention is similar to the idea of optimal financial leverage.

Khan's (2021) study on leverage target and payout policy reported that firms are likely to increase divides when they operate below-target debt. A study by Pruitt and Gitman (1991) focused on the interactions between investment, financing, and dividend decisions and observed that the firm's risk impacts dividend payout by American firms. The above previous studies do not show the association of refinancing risk with retention and payout ratios. Therefore, the current study tests the impact of corporate debt refinancing risk on the retention and payout ratios using the following research questions:

Does corporate debt refinancing riskincrease the retention ratio?

Does corporate debt refinancing risk decrease the payout ratio?

The results show that the change in corporate debt refinancing risk increases the retention ratio and decreases the payout ratio. The findings also show that the change in corporate debt refinancing risk forces American publicly traded firms to reduce debt leverage in the capital structure. The current study adds to the literature on the relations of refinancing risk with the plowback and payout ratios and thus may help investors make stock investment decisions and financial management consultants to provide consulting services.

The empirical findings lend some support to the findings of Pruitt and Gitman (1991) and Amidu and Abor (2006) in that corporate debt refinancing risk decreases the payout ratio. The findings of this study are generalizable to the manufacturing and service publicly traded firms like those used in this study. While section two shows a literature review, section three describes the methodology. Section four of the study provides empirical analysis and findings. Finally, section five of the study shows discussion and conclusion and provides recommendations for future research.

2 REVIEW OF LITERATURE

2.1 Impact of debt refinancing risk on retention and payout ratios

Previous studies by Brav, Graham, Harvey, and Michaely (2005) and Khan (2021) show that firms are reluctant to make dividend cuts and desire to raise external funds to continue payout without any dividend cuts.The bird-in-hand theory of Myron Gordon (1959) and John Linter

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(1956) argued that investors (e.g., shareholders) prefer dividends over capital gains. The cash dividend preferences made by investors make cutting dividends challenging for the firm. Therefore, firms tryto smooth dividend payments to shareholders (Panagiotis, Stylianos, and Aichen,2021). However, an increase in external debt can cause refinancing risk for the firms. Brav et al. (2005) showed a negative association between debt leverage and dividend payout, indicating that increased debt in the capital structure decreases dividend payout. In addition, the desire to raise external funds to pay out dividends can lead to agency problems between stakeholders (principals) and the firms (agents) (Jensen and Meckling, 1976).

External borrowing to pay out dividends can cause information asymmetrical issues between the firms' managements and corporate bondholders (Gill, Amiraslany, Obradovich, and Mathur, 2019; Myers and Majluf, 1984), decreasing future dividend payouts. For example, bondholders can add covenants on the bond contracts (Ross, Westerfield, Jordan, Pandes, and Holloway, 2022),enforcing the firms not to pay dividends through external borrowings. However, a study by Aktan, Celik, Abdulla, and Alshakhoori (2019) showed that the firms' management desires and considers maximizing their utilities to gain benefits such as an increase in their compensations by improving corporations' reputations. Thus, management's hardworking behaviour impacts the corporate debt leverage (Kisgen, 2006) to reduce the refinancing risk by increasing the retention ratio and decreasing the dividend payout ratio.

Dividend payout decreases owners' equity by reducing the retention ratio, increasing the debt leverage ratio (Khan, 2021), and consequently increasing refinancing risk. The debt refinancing risk can send a negative signal in the market, leading to higher external financing issues because bondholders can also be shareholders. Therefore, firms' management is reluctant to send a negative signal related to dividend payout since dividend payout signals corporate improvements (Kumar, 1988) and, thus, helps reduce external financing issues. However, DeAngelo, DeAngelo, and Skinner (2008) indicated that established and financially strong firms with lower information asymmetry pay dividends and rarely need to signal.

The findings of Lintner (1956) showed that corporations with below-target debt could smooth both dividend payouts without hurting the firm. Lambrecht and Myers's (2012) findings indicated that dividend payout depends on capital structure decisions. However, dividend payout may strengthen the firm in the capital market and decrease monitoring costs (Easterbrook, 1984). A study by Farre-Mensa, Michaely, and Schmalz (2023) showed that 42% of firms that pay out equity capital initiate debt or equity issues in the same year, which results in 32% of aggregate payouts generated from external financing. However, Amidu and Abor (2006) noted a negative relationship between the firm's risk and dividend payout. Another empirical study by Pruitt and Gitman (1991) found that the firm's risk determines and impacts payout policy.

In short, the limited availability of literature indicates that corporate debt refinancing risk increases the retention ratio and decreases the payout ratio. Myers's (1984) Pecking-Order Theory showed that firms use internal financing first and then seek external financing, which supports the retention ratio concept. However, Gordon's (1959) and Linter's (1956) theory of bird-in-hand make it difficult for firms to cut payout. Nevertheless, refinancing risk can force firms to cut payouts through bondholders who can add covenants and clauses to the bond agreements. Accordingly, the following first and second hypotheses:

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First hypothesis: The increase in corporate debt refinancing risk increases the retention ratio.

Second hypothesis: The increase in corporate debt refinancing risk decreases the payout ratio.

2.2 Changes in debt refinancing risk, retention, and payout ratios: Role of debt leverage changes

Changes in corporate debt leverage significantly influence retention and dividend payout ratios (Banerjee and De, 2015). The bondholders control the firm by adding negative covenants on bond agreements (e.g., limiting dividend payout and stopping the firm from issuing additional debt) and positive protective covenants (e.g., maintaining a certain level of working capital) to limit dividend payout and increase retention ratios to reduce the chances of bankruptcy and refinancing risk (Ross et al., 2022). Cooper and Lambertides (2018) found that a significant dividend payout increases a firm's leverage. The debt leverage forces the firms to avoid paying dividends and increase the retention ratio. Asif, Rasool, and Kamal (2018) found that financial leverage negatively impacts the dividend payout in Pakistan. In addition, higher debt leverage increases refinancing risk for the firms, thus forcing the corporations to decrease dividend payout and increase retention ratio. In summary, corporate debt leverage changes mediate the association between refinancing risk, dividend payout, and retention ratio. Hence, the third and fourth hypotheses:

Third hypothesis: The effect of corporate refinancing risk on the dividend retention ratio is pronounced for changes in corporate debt leverage.

Fourth hypothesis: The effect of corporate refinancing risk on the dividend payout ratio is pronounced for changes in corporate debt leverage.

3 METHODOLOGY

3.1 Research design, variable measurements, and data collection

This study collected data from the COMPUSTAT of Wharton Research Data Services from 2014 to 2023 and deleted outliers to use a correlational and non-experimental research design. The current study borrowed measurements related to corporate debt refinancing risk, debt leverage, net operating working capital, cash reserve, current ratio, cash flow, cash flow volatility, firm size, sales revenue growth, net income, financial distress, corporate globalization, and industry from Gill, Amiraslany, Obradovich, and Mathur (2019). Ross et al. (2022) provided retention ratio and payout ratio measurements. This study shows the measurements of all the variables in Table 1.

[Insert Table 1 about Here]

4 EMPIRICAL MODELS AND STATISTICAL ANALYSIS

4.1 Empirical models

Amidu and Abor (2006) showed a negative relationship between risk and dividend payout; therefore, this study expects a negative association of the changes in corporate debt refinancing risk (*ΔCD_RFR*) with the change in cash dividend payout ratio (*ΔCDP_RATIO*) and change in retention ratio (*ΔR_RATIO*). The current study used *ΔCD_RFR* as the main explanatory variable. Other variables such as a change in debt leverage (*ΔD_LEV*), change in net operating working capital (*ΔN_OWC*), change in cash reserve (*ΔC_RES*), change in the current ratio (*ΔCR*), change in cash flow (*ΔCF*), cash flow volatility (*STD_CF*), change in firm size (*ΔFS*), sales revenue growth (*SRG*), change in net income (*ΔNI*), financial distress

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(*FIN_DIS*), corporate globalization(*C_GLOBAL*), and industry (*IND*) were used as control variables.This study used ordinary least squares (OLS) regression analysis to test hypotheses and adopted the following regression equations:

$$Y_i = \alpha_0 + \alpha_1 \Delta CD\_RFR_i + \sum \delta_i X_i + \varepsilon_i \quad (1)$$

$$Y_i = \beta_0 + \beta_1 \Delta CD\_RFR * \Delta D\_LEV_i + \sum \delta_i X_i + \varepsilon_i \quad (2)$$

In the above Models (1) and (2), i refers to the individual firm, and X_i represents individual control variables corresponding to individual production/service firm i. Y in Models (1) and (2) is the ΔCDP_RATIO and $\Delta R\_RATIO.\varepsilon_i$ in Models (1) and (2) refers to a normally distributed disturbance term. α_1, in Model (1), measures the magnitude at which changes in corporate debt refinancing risk increase the retention ratio and reduce cash dividend payout. β_1 in Model (2) measures the magnitude at which change in corporate debt leverage mediates the association of debt refinancing risk with retention and payout ratios.This study extended Models (1) and (2) by considering a different set of control variables once at a time. This study used Model (1) to test the first and second hypotheses. In addition, this study used Model (2) to test the third and fourth hypotheses, respectively.

4.3 Descriptive statistics and Pearson correlation analysis

The current study provides the descriptive statistics in Table 2. While the corporate dividend payout ratio decreased by 7.2%, the retention ratio decreased by 4.30%. The corporate debt refinancing risk increased by 31.50%, and debt leverage increased by 14.20% in American firms. The net operating working capital, cash flow, firm size, sales revenue growth, and net income after tax decreased by 6.50%, 2.40%, 2.10%, 2.50%, and 21%, respectively. However, in American firms, cash reserve, current ratio, and cash flow volatility increased by 30.80%, 24%, and 35.80% over the last ten years.

[Insert Table 2 about Here]

This study shows the Pearson correlation analysis in Table 3. The data analysis shows that *ΔCD_RFR*, *ΔD_LEV*, *ΔC_RES*, *ΔCR*, *ΔCF*,*STD_CF*, and *FIN_DIS* ($_{\Delta CD\_RFR,\ \Delta CDP\_RATIO}$ = -0.038; $_{\Delta D\_LEV,\ \Delta CDP\_RATIO}$= -0.050; $_{\Delta C\_RES,\ \Delta CDP\_RATIO}$= -0.072; $_{\Delta CR,\ \Delta CDP\_RATIO}$ = -0.038;$_{\Delta CF,\ \Delta CDP\_RATIO}$ = -0.020;$_{\Delta STD\_CF,\ \Delta CDP\_RATIO}$ = -0.061; and $_{\Delta FIN\_DIS,\ \Delta CDP\_RATIO}$= -0.044) negatively and significantly correlated the *ΔCDP_RATIO*, indicating that the increase in corporate debt refinancing risk, debt leverage, cash reserve, current ratio, cash flow volatility, and financial distress decrease the dividend payout ratio. Likewise, the correlationanalysis shows that *ΔFS*, *SRG*, and*ΔNI* ($_{\Delta FS,\ \Delta CDP\_RATIO}$ = 0.059; $_{\Delta SRG,\Delta CDP\_RATIO}$ = 0.030; and $_{\Delta NI,\ \Delta CDP\_RATIO}$ = 0.083) positively and significantly correlated the *ΔCDP_RATIO*, implying that increase in firm size, sales revenue growth, and net income increase corporate dividend payout ratio in American firms. Similarly, *ΔCD_RFR*, *ΔD_LEV*, *ΔC_RES*, *ΔCR*, and *STD_CF* ($_{\Delta CD\_RFR,\ \Delta R\_RATIO}$ = 0.032; $_{\Delta D\_LEV,\ \Delta R\_RATIO}$ = 0.024; $_{\Delta C\_RES,\ \Delta R\_RATIO}$ = 0.016; $_{\Delta CR,\ \Delta R\_RATIO}$ = 0.011;and $_{\Delta STD\_CF,\ \Delta R\_RATIO}$ = 0.015) positively and significantly correlated the *ΔR_RATIO*, suggesting that the increase in corporate debt refinancing risk, debt leverage, cash reserve, current ratio, and cash flow volatility increase the retention ratio. Further, *ΔCF*, *ΔNI*, and*C_GLOBAL* ($_{\Delta CF,\ \Delta R\_RATIO}$ = -0.011; $_{\Delta NI,\ \Delta R\_RATIO}$ = -0.019; and $_{\Delta C\_GLOBAL,\ \Delta R\_RATIO}$ = -0.010) negatively and significantly correlated the *ΔR_RATIO*, implying that the increase in cash flow, net income, and corporate globalization reduces the retention ratio of American publicly traded firms.

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[Insert Table 3 about Here]

4.4 Regression results

Using OLS regression analysis for equations (1) and (2), the current study provides the findings in Table 4.

4.4.1 Corporate debt refinancing risk and payout ratio

The dataanalysis shows that the coefficient of*ΔCD_RFR* in column (1) of Table 4 is negative and significant at the 1% level, implying that an increase in corporate debt refinancing risk reduces the dividend payout ratio in American publicly traded firms. Thus, the first hypothesis is supported.In addition, the *ΔD_LEV*, *ΔCF*, and *FIN_DIS* coefficients in column (1) of Table (4) are negative and significant at the one percent level, implying that the increase in debt leverage, cash flow, and financial distress reducesthe corporate dividend payout ratio. Besides, the analysis shows the coefficients of *ΔFS* and *ΔNI* in column (1) of Table (4) as positive and significant at the 1% level, suggesting that the increase in firm size and net income increasesthe dividend payout ratio.

4.4.2 Impact of corporate debt refinancing riskon retention ratio

The data analysis shows the coefficient of *ΔCD_RFR* in column (2) of Table 4 as significant at the one percent level, implying that an increase in corporate debt refinancing risk increases the retention ratio in American publicly traded firms. Thus, the second hypothesis is supported.In addition, the data analysis shows the coefficient of *ΔD_LEV* in column (2) of Table (4) as positive and significant at the one percent level, implying that the increase in debt leverage increases the retention ratio. Besides, the coefficients of *ΔCF*, *ΔNI*, and*ΔC_GLOBAL* in column (2) of Table (4) are negative and significant at the ten percent and five percent levels, suggesting that the increase in cash flow, net income, and corporate globalization reduces corporate the retention ratio.

4.4.3 Debt refinancing risk changes, retention ratio, and payout ratio: Role of debt leverage changes

Table 4 shows the coefficients of *ΔCD_RFR*ΔD_LEV* in columns (2) and (4) of *ΔCDP_RATIO*

and *ΔR_RATIO* as negative and positive, respectively, both significant at the one percent levels, indicating that corporate debt leverage changes mediate the association between refinancing risk, dividend payout, and retention ratio. Thus, these findings support the third and fourth hypotheses. That is, the effect of corporate refinancing risk on the dividend payout and retention ratios is pronounced for changes in corporate debt leverage. The coefficients of *ΔCF* and *ΔC_RES* in column (3) of Table (4) are negative and significant at the ten and one percent levels, implying that the increase in cash flow and corporate cash reserve decreases the payout ratio. In addition, the coefficients of *ΔFS* and*ΔNI* in column (3) of Table (4) are positive and significant at the five and one percent levels, suggesting that the increase in firm size and net income increases the corporate dividend payout ratio. Besides, the *ΔCF*, *ΔNI*, and *C_GLOBAL* coefficients in column (4) of Table (4) are negative and significant at the ten and five percent levels, indicating that changes in cash flow, net income, and corporate globalization decrease retention ratio.

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4.4.4 Summary of results

In summary, corporate debt refinancing risk reduces the dividend payout and increases the retention ratio. Corporate debt refinancing risk encourages American publicly traded firms to reduce debt leverage. In addition, corporate debt leverage changes mediate the association between refinancing risk, dividend payout, and retention ratio.

[Insert Table 4 about Here]

5 DISCUSSION AND CONCLUSION

We tested the impact of corporate debt refinancing risk on payout and retention ratios. Theempirical analysis shows that corporate debt refinancing risk decreases the dividend payout ratio but increases the retention ratio. In addition, corporate debt refinancing risk encourages American publicly traded firms to restructure capital structure by reducing debt leverage. Our analysis shows that changes in corporate debt leverage moderate the association between refinancing risk, dividend payout, and retention ratio; therefore, we pronounce the effect of corporate refinancing risk on the dividend payout and retention ratios for changes in corporate debt leverage. The empirical results lend some support to the findings of Pruitt and Gitman (1991) and Amidu and Abor (2006) in that corporate debt refinancing risk decreases the payout ratio. From a theoretical perspective, corporate debt refinancing risk is not in the firm's favour.

While the increase in the corporate debt leverage, cash flow, and financial distress reduces the corporate dividend payout ratio, firm size and net income increase the dividend payout ratio. The opposite relationship between cash flow and the dividend payout ratio may be because of the COVID-19 situation in which the firms were compelled to retain the cash flow. The increase in debt leverage enhances the retention ratio. However, the increase in cash flow, net income, and corporate globalization reduces the retention ratio. The opposite association between net income and retention ratio may be due to COVID-19, which decreased American firms' profitability. Table 2 shows that while net income decreased by 21%, cash flow decreased by 2.40%. In addition, the positive correlation between the corporate debt refinancing risk and cash reserve shown in Table 3 indicates that refinancing risk increases corporate cash reserve.

In conclusion, corporate debt refinancing risk reduces the payout ratio by 2.70% and increases the retention ratio by 1.30% (see Table 4). Since refinancing risk decreases dividend payout for the shareholders, American firms should consider reducing corporate debt refinancing risk and having optimal capital structure to maximize shareholders' wealth.

5 IMPLICATIONS AND FUTURE RESEARCH

Although the current study provides valuable results, it has managerial implications and limitations. The results show that increased corporate debt refinancing risk reduces the dividend payout ratio and increases retention. However, this may only be true for some American publicly traded firms. Therefore, results should be used with caution. In addition, the current study is limited to American publicly traded firms; therefore, generalization of the results may be limited. Besides, the empirical results may only apply to firms like those used in this study.

The practical limitation of this study is that the changes may only be applied to some American firms. For example, a reduction in refinancing risk may increase dividend payout in one firm, not others, because the economic situation in which American firms operate differs based on their locations in the geographic areas. Therefore, future studies should

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investigate the generalizations of these findings beyond American publicly traded firms. Future studies should also consider using essential control variables such as industry sectors and capital structure from different industries and countries.

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Tables

Table 1 Proxy Variables and their Measurements

Dependent Variables		**Measurements**
Change in Cash Dividend Payout Ratio	ΔCDP_RATIO_i	Measured as total cash dividend paid to common shareholders scaled by net income after tax. $\Delta CPD\_RATIO = (CPD\_RATIO_{t+1} - CPD\_RATIO_t) \div CPD\_RATIO_{tt}$
Change in Retention Ratio	ΔR_RATIO_i	Measured as one minus cash dividend payout ratio. $\Delta R\_RATIO = (\Delta R\_RATIO_{t+1} - \Delta R\_RATIO_t) \div \Delta R\_RATIO_t$
Independent (explanatory variable)		**Measurements**
Change in Corporate Debt Refinancing Risk	ΔCD_RFR_i	Measured as the corporation's current portion of long-term corporate debt due within one year divided by total debt. $\Delta CD\_RFR = (\Delta CD\_RFR_{t+1} - \Delta CD\_RFR_t) \div \Delta CD\_RFR_t$
Control Variables		**Measurements**
Change in Net Operating Working Capital	ΔN_OWC_i	This study measured net operating working capital as: (Inventory +Accounts receivables) - Accounts payables]/ Total assets. $\Delta N\_OWC = (N\_OWC_{t+1} - N\_OWC_t) / N\_OWC_t$
Change in Cash Reserve	ΔC_RES_i	This study measured cash reserve as:Cash and cash equivalent / Total assets. $\Delta C\_RES = (C\_RES_{t+1} - C\_RES_t) \div C\_RES_t$
Change in Current Ratio	ΔCR_i	This study measured the current ratio as:Current assets /Current liabilities. $\Delta CR = (CR_{t+1} - CR_t) \div CR_t$
Change in Cash Flow	ΔCF_i	This study measured the cash flow as: (Operating income before extraordinary items +Depreciation)/Fixed assets. $\Delta CF = (CF_{t+1} - CF_t) / CF_t$
Volatility in Cash Flow	STD_CF_i	This study measured volatility in cash flow as the square root of the variance in cash flow from operating activities for a given year over the previous year.

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Firm Size Change	ΔFS_i	This study measured firm size change as the changes in corporate assets. $\Delta FS = (FS_{t+1} - FS_t) \div FS_t$
SalesRevenue Growth	SRG_i	This study measured corporate revenue growth as the one-year sales revenue growth rate at time t: $(SRG_t - SRG_{t-1}) / SRG_{t-1}$.
Net Income Change	ΔNI_i	This study measured net income change as: Net income after tax / Net sales revenue. $\Delta NI = (NI_{t+1} - NI_t) / NI_t$
Debt LeverageChange	ΔD_LEV_i	This study measured debt leverage change as: Total debt /Total assets. $\Delta D\_LEV = (D\_LEV_{t+1} - D\_LEV_t) / D\_LEV_t$
Financial Distress	FIN_DIS_i	This study used Aktas, Croci, and Petmezas's (2015) benchmark to measure corporate financial distress. Firms are considered financially distressed if they face difficulty covering interest expenses. Financial distress happens when the firm's interest coverage ratio (i.e., Operating income before depreciation ÷ Interest expense) is less than 0.80 in any given year or below one for two consecutive years.
Corporate Globalization	C_GLOBAL_i	Assigned one for the firm that operates in the global marketand 0 for otherwise
Industry	IND_i	This study assigned the value1 to manufacturing/production corporations and 0 to service firms.

Table 2 Descriptive Statistics

	Mean	*Standard Deviation*	*Minimum*	*Median*	*Maximum*
ΔCDP_RATIO	-0.072	1.455	-7.99	-0.09	9.98
ΔR_RATIO	-0.043	0.917	-6.97	0.000	10.85
ΔCD_RFR	0.315	2.235	-1.00	0.000	25.67
ΔD_LEV	0.142	1.565	-1.00	0.022	21.50
ΔN_OWC	-0.065	1.839	-18.50	0.000	24.67
ΔC_RES	0.308	1.853	-1.00	0.000	27.50
ΔCR	0.240	1.749	-10.45	-0.040	24.74
ΔCF	-0.024	1.998	-14.88	0.000	24.38
STD_CF	0.358	1.055	0.00	0.030	9.97

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ΔFS	-0.021	0.876	-16.7	0.005	24.3
SRG	-0.025	1.021	-4.99	0.010	7.97
ΔNI	-0.210	2.400	-19.67	-0.140	24.50
FIN_DIS	0.35	0.477	0	0.000	1
C_GLOBAL	0.14	0.350	0	0.000	1
IND	0.23	0.421	0	0.000	1

Variables include the change in cash dividend payout ratio(*ΔCDP_RATIO*), change in retention ratio(*ΔR_RATIO*), corporate debt refinancing risk (*ΔCD_RFR*), change in debt leverage (*ΔD_LEV*), change in net operating working capital (*ΔN_OWC*), change in cash reserve (*ΔC_RES*), change in the current ratio (*ΔCR*), change in cash flow (*ΔCF*), cash flow volatility (*STD_CF*), change in firm size (*ΔFS*), sales revenue growth (*SRG*), change in net income (*ΔNI*), financial distress (*FIN_DIS*), corporate globalization(*C_GLOBAL*), and industry (*IND*).

Table 3 Correlation coefficient

		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
1	*ΔCDP_RATIO*	1														
2	*ΔR_RATIO*	-0.144**	1													
3	*ΔCD_RFR*	-0.038**	0.032**	1												
4	*ΔD_LEV*	-0.050**	0.024**	-0.018**	1											
5	*ΔN_OWC*	-0.012	0.005	0.052**	0.031**	1										
6	*ΔC_RES*	-0.072**	0.016**	0.033**	-0.045**	-0.012*	1									
7	*ΔCR*	-0.038**	0.011*	-0.040**	-0.067**	-0.027**	0.288**	1								
8	*ΔCF*	-0.020*	-0.011*	0.018**	0.016*	0.040**	0.057**	0.030**	1							

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9	*STD_CF*	-0.061**	0.015**	-0.023**	0.028**	-0.029**	0.063**	0.103**	-0.029**	1					
10	*ΔFS*	0.059**	-0.009	0.036**	0.068**	0.001	0.021**	0.058**	0.014**	0.014**	1				
11	*SRG*	0.030**	-0.001	0.019**	-0.022**	-0.003	-0.014**	0.016**	0.023**	-0.039**	0.129**	1			
12	*ΔNI*	0.083**	-0.019**	0.008	0.016*	0.003	-0.019**	-0.008	0.073**	-0.034**	0.031**	0.035**	1		
13	*FIN_DIS*	-0.044**	0.000	-0.009	0.027**	-0.028**	0.000	0.107**	-0.017**	0.299**	0.008	-0.022**	-0.006	1	
14	*C_GLOBAL*	0.008	-0.010*	0.012	-0.021**	0.013**	-0.021**	-0.018**	0.002	-0.069**	-0.004	-0.003	0.002	-0.150**	1
15	*IND*	0.013	0.004	0.005	0.028**	-0.005	-0.040**	0.005	-0.020**	0.209**	0.024**	-0.010*	-0.008	0.170**	0.053**	1

Notes: ** = 5%, and *** = 1%. Variables include the change in cash dividend payout ratio(*ΔCDP_RATIO*), change in retention ratio(*ΔR_RATIO*), corporate debt refinancing risk (*ΔCD_RFR*), change in debt leverage (*ΔD_LEV*), change in net operating working capital (*ΔN_OWC*), change in cash reserve (*ΔC_RES*), change in the current ratio (*ΔCR*), change in cash flow (*ΔCF*), cash flow volatility (*STD_CF*), change in firm size (*ΔFS*), sales revenue growth (*SRG*), change in net income (*ΔNI*), financial distress (*FIN_DIS*), corporate globalization(*C_GLOBAL*), and industry (*IND*).

Table 4: Results from ordinary least square (OLS)

*Dependent variable = ΔCDP_RATIO, ΔR_RATIO,*and *ΔD_LEV*

	OLS				*Auxiliary regression (OLS)*
Variables	*ΔCDP_RATIO* *(1)*	*ΔR_RATIO* *(2)*	*ΔCDP_RATIO* *(3)*	*ΔR_RATIO* *(4)*	*ΔD_LEV* *(7)*
ΔCD_RFR	-0.027**	0.013**			-0.030**
	(-2.91)	(3.53)			(-5.47)
ΔD_LEV	-0.063**	0.017**			
	(-3.40)	(2.69)			
*ΔCD_RFR*ΔD_LE*			-0.028**	0.016**	

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V					
			(3.31)	(4.74)	
ΔN_OWC	0.010	0.006	0.008	0.007	0.017†
	(0.55)	(0.93)	(0.67)	(1.09)	(1.83)
ΔC_RES	-0.025	0.000	-0.026†	0.001	-0.022*
	(-1.62)	(0.04)	(-1.70)	(0.20)	(-2.61)
ΔCR	-0.038	0.015	-0.019	0.011	-0.103**
	(-1.28)	(1.64)	(-0.65)	(1.15)	(-7.93)
ΔCF	-0.067**	-0.008†	-0.071**	-0.008†	-0.001
	(-3.94)	(-1.75)	(-4.18)	(-1.72)	(-0.08)
STD_CF	-0.029	-0.002	-0.042	-0.002	0.027
	(-0.43)	(-0.12)	(-0.62)	(-0.11)	(1.20)
ΔFS	0.583*	-0.029	0.545*	-0.024	0.244**
	(2.49)	(-0.89)	(2.33)	(-0.74)	(5.14)
SRG	-0.020	0.003	-0.013	0.001	-0.077**
	(-0.77)	(0.38)	(-0.49)	(0.08)	(-6.34)
ΔNI	0.063**	-0.006†	0.063**	-0.006†	0.004
	(6.28)	(-1.79)	(6.31)	(-1.90)	(0.83)
FIN_DIS	-0.642**	0.011	-0.621**	0.017	0.256**
	(-4.76)	(0.48)	(-4.65)	(0.76)	(7.82)
C_GLOBAL	-0.008	-0.048*	0.001	-0.049*	-0.072*
	(-0.18)	(-2.48)	(0.03)	(2.54)	(-2.62)
IND	0.041	-0.029	0.048	-0.027	0.039
	(0.92)	(-1.61)	(1.08)	(-1.48)	(1.50)
Constant	0.016	-0.019	-0.010	-0.010	0.157**
	(0.49)	(-1.45)	(-0.31)	(-0.76)	(8.44)
N	5,205	11,963	5,362	12,278	12,147
F-Value / χ^2	9.15**	2.93*	9.17**	3.52*	20.75**
R^2	0.022	0.003	0.02	0.003	0.020

Notes: † = 10%, * = 5%, and ** = 1%; Dependent variables include the change in cash dividend payout ratio(*ΔCDP_RATIO*) and change in retention ratio(*ΔR_RATIO*). Independent variables are change in corporate debt refinancing risk (*ΔCD_RFR*), change in debt leverage (*ΔD_LEV*), change in net operating working capital (*ΔN_OWC*), change in cash reserve (*ΔC_RES*), change in the current ratio (*ΔCR*), change in cash flow (*ΔCF*), cash flow volatility

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(*STD_CF*), change in firm size (*ΔFS*), sales revenue growth (*SRG*), change in net income (*ΔNI*), financial distress (*FIN_DIS*), corporate globalization(*C_GLOBAL*), and industry (*IND*). Multicollinearity is not a serious issue in this study since the lowest tolerance is 0.622, and the highest variance inflation factor (VIF) is 1.609.