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Earnings Downside Risk and Capital Structure

이익하락위험이 자본구조에 미치는 영향

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이 논문을 김예원 석사학위논문으로 제출함

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Earnings Downside Risk and Capital Structure

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ABSTRACT

Financial statements are known to reveal firms' fundamental risks. Especially when firms are undergoing downward times, firm performance stays below its reasonable expectation. EDR (Earnings Downside Risk) measure is known to capture a firm's earnings down side risk using residual from the ROA expectation model. EDR links to bad performance, and subsequent performance should be negatively associated with EDR. And the firms' fundamental risk affects capital structure. I find evidence that firms with high EDR tend to have loss and lower profit. As EDR is higher, firms generate equity financing more than debt financing. Specifically, EDR is positively associated with equity financing, however, the association is insignificant with debt financing. Also there's positive relation between EDR and net sales in divestiture. In a result of financing, level of internal cash is significantly higher in the high EDR firm than in the lower EDR firm. High EDR indicates that firm cannot earn extra profit (alpha or residual income) with current operating system. In other word, the firms that have high EDR need to be more profitable through focusing on the growth potential enterprise. In the trial for the choice and concentration, firms need financing. Financing is very important for firm's survival especially in the downside risk. This study has incremental contribution to examine firms' behavior when they have uncertainty, especially when facing downside risk. The findings allow to have better understanding of firm behavior.

Keywords*: Earnings downside risk, capital structure, external financing*

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1. INTRODUCTION

This study examines the relationship between earnings downside risk (EDR) and the firm's capital structure. It is widely accepted that uncertainty induces firms to deviate from their normal behavior. Thus, earnings volatility has been known as a key concept in risk assessment (e.g., Beaver et al. 1970; Beaver 1997). However, research in accounting has rarely focused on the downside risk while mostly focusing on upside risk, even though risk mainly presents through increase in the firm's left-tail risk (e.g., Bawa 1975). Recently, Konchitchki et al. (2016) suggest that EDR positively affects firms' fundamental risk and firms with higher EDR experience more negative operating performance over the subsequent period.

The extant literature documents that accounting based EDR captures different components of risk compared to stock return based EDR (e.g. Chen et al. 2001; Kim et al. 2011). While both EDR and return downside risk are related with downside risk, EDR provides important dimensions of fundamental risk not captured by its return based equivalent. While return based downside risk measures often shed light on extreme downward scenarios using stock price crashes or extreme left-tail returns, EDR focuses on more general downside patterns of firms' fundamental operations using accounting information. In addition, prior literature posits that a firm's EDR positively affects its cost of capital (Konchitchki et al. 2016). This is to say, accounting based EDR reflects the underlying risk of firms.

While a long line of prior studies documents issues influencing a firm's capital structure decision, little is known on how EDR influences the capital structure decision of a firm. Many empirical research (e.g., Frank and Goyal 2003) find that firms make their capital structure decisions based on the pecking order in the normal state. That is, Myers (1984) proposed the pecking order theory (POT), which indicates that "the firm has no well-defined target debt-to-value ratio," and that firms generally prefer to firstly use internal financing, then secondly external debt financing, and thirdly external equity financing. In reality, however, company operations and the associated accounting structures are more complex than the standard concept of pecking order theory. Even though POT is not the perfect method to explain capital structure, the fact from the theory that cost of equity is higher than cost of debt is quite obvious. Based on this line of reasoning, it is natural to initially assume that firms prefer debt financing over equity financing. However, in the downside risk, it is not obvious for firm to choose financing source. Hence, this paper empirically investigates the effect of EDR on a firm's capital structure change.

This study examines the capital sources preferred by firms that are facing EDR. Upon empirical investigation, I find that a firm with high EDR is more likely to rely on the equity financing than debt financing. More specifically, I document that EDR is positively related with equity financing, but the association is not significant between EDR and debt financing. Also there is positive association

between EDR and net sales in divestiture. After all, firms increase their internal cash as a result of various financing.

This study provides important contributions to accounting literature. First, my findings shed light on firms' behavior when faced with uncertainty, especially more towards bad states. Because the decision for the capital structure is crucial for firms' operation when firms are in the crisis, it gives deep understanding of firm behavior and has incremental contribution for accounting research. Second, I document an external financing order in EDR under the POT. This is to say, it is interesting to see what financing sources firms generally lean towards when they are facing high EDR. This study improves our understanding of firm behavior by focusing on the behavior of firms that are facing earnings downside risk, a context that is rarely examined which. Finally, this study has potential to extend for the further research regarding on the relation between EDR and other various firm behavior in investment decision or overcoming EDR.

I acknowledge that there may exist some unknown factors that simultaneously influence both EDR and capital structure choices, and the concerns may not be fully eliminated. Measurement issues may also exist, making it challenging to capture EDR of different firms that are facing different circumstances. In this case, the measurement error in the empirical test variables may distort the empirical results. Overall, causality is difficulty to establish, so I do not assume any direct causality but stop at documenting association.

The structure of the rest of this paper is as follows. Section 2 presents the prior literature and hypothesis development. The measurement method are describes in section 3. Section 4 presents the research design. Results are presented in section 5. Section 6 shows the additional analysis. Conclusions are presented in section 7.

2. PRIOR LITERATURE AND HYPOTHESIS DEVELOPMENT

2.1 Earnings downside risk

I focuse on the below-expectation variability in earnings and examine EDR by constructing a metric. This metric largely follows Konchitchki et al. (2016) and employs the mathematical foundation associating risk with outcomes of Stone (1973) and Fishburn (1977) approaches. To calculate EDR, I examine an earnings expectation model and use a probability weighted function of below-expectation relative to above-expectation residuals such as earnings surprises. I examine unexpected downside earnings patterns to see the fact that firms' decision making is associated with risk with attaining less expected outcomes (Fishburn 1977).

Here, EDR basically captures the expectation for downside trend in future operating earnings. This metric uses the sample mean as a fixed reference level rather than expected earnings (Nawrocki and Staples 1989; Unser 2000; Biddle et al. 2015) and differs from standard moment estimations such as earnings volatility, which weights upside and downside states equally or semi-variance such as below-mean variability.

Accounting-based EDR measure is different compared to the stock-based measures of return downside risk from prior research (e.g., Chen et al. 2001; Kim et al. 2011). That is, while both EDR and return downside risk examine downward situations, EDR can provide an idea of fundamental risk which is difficult to be captured by the return-based measures. While return-based downside risk measures are related with extreme downward situations using stock price crashes or extreme left-tail returns, EDR focuses on more general downside patterns of firms' fundamental operations using accounting information. In addition, earnings and stock returns provide different information in terms of persistence, predictability, and noise, resulting in differences between the EDR and return downside risk measures. Putting it concretely, earnings tend to be persistent (Sloan 1996), while stock returns are normally not (Fama 1965b). Bansal and Yaron (2004) claim that long-run risk and equity premium is persistent in firm fundamentals' growth. I insist that earnings-based measure can provide a different dimension of risk compared with returns-based measures. In terms of predictability, prior research compares earnings information with returns information. For example, Ball and Brown (1968) find that earnings can lag returns. Beaver (1997), Beaver et al.(1997), Konchitchki (2011), however, state that earnings can lead returns or can change for reasons not leading to returns and returns can move contemporaneously with earnings, with an increasing overlap when earnings are aggregated over time (e.g., Easton and Harris 1991; Easton et al. 1992). Prior research also indicates that stock-

related effects confound how earnings relate to returns and earnings can provide information different from returns. For example, this research demonstrates that non-fundamental market disturbances, biases, stock market microstructure frictions, investor opinion divergence and sentiment, and short-sale constraints affect to stock returns (e.g., Hong and Stein 2003; Pastor and Stambaugh 2003; Berkman et al. 2009). Consistent with the various prior research in different areas, studies indicate that there is a low explanatory power in the earnings-returns association (e.g., Bernard 1989; Lev 1989; Easton et al. 1992; Hyan 1995) which claims to a marginal overlap between earnings and returns. However, the overlap in downside risk related to earnings and returns is an empirical problem, and the prior literature finds a result that the information in EDR is incremental to those of return downside risk measures.

2.2 Capital structure

The POT of capital structure, from Myers (1984) as well as Myers and Majluf (1984), is one of the most important theories of corporate leverage. According to Myers (1984), due to adverse selection, firms prefer to use financing in the order from internal to external financing. Suppose that there are three sources of funding which are available to firms: retained earnings, debt, and equity. Retained earnings do not have adverse selection problem. On the other hand, equity is subject to severe adverse selection problems while debt has only a small adverse selection

problem. From the outside investor's point of view, equity is much riskier than debt. It is natural that even though both have an adverse selection risk premium, but equity has large the premium. Therefore, it is natural to demand a higher rate of return on equity compared to debt.

From the perspective of those inside the firm, retained earnings are a better source of funds than is debt, and debt is a better financing source than equity. Accordingly, the firm will invest all projects using retained earnings as much as possible. If there is ome amount of retained earnings, then debt financing will be used as the first alternative to retained earnings according to POT. This is because when outside funds are necessary, firms prefer debt to equity because of lower information costs associated with debt issues. Even though POT is not the perfect method to explain capital structure, the fact from the theory that cost of equity is higher than cost of debt is quite obvious. According to pecking order theory, firms use financing in an order of internal cash, debt and equity. This is to say, equity is rarely issued. Thus, for a firm in normal operations, equity will not be used and the financing deficit will match the net debt issues. In reality, however, company operations and the accounting structures are more complex than the pecking order representation which is associated with financing order of firm in terms of adverse selection. It is not obvious to use financing in order of lower cost of financing in the earnings downside risk.

2.3 Hypothesis development

In the downside risk, accounting earnings reveal firm's fundamental risk, which leads to downgrade credit rate (Konchitchki et al. 2016). As firms' accounting performance get worse or the accounting profit is below the expected level in succession, cost of debt and cost of equity are both known to increase. Increasing cost of debt and cost of equity makes firms alter their capital structure. Even though cost of debt and cost of equity both tend to increase, it's hard to borrow money from the bank. Firms have to endure high cost of equity in the bad states. The fact that firms use more equity than debt indicates that firm endure high cost for financing.

It can possibly be explained with that as firm's credit rate gets worse, it's hard to borrow money from bank. It is known that bank and financial institution are sophisticated investors, which makes them more conservative for firm which has earning downside risk. Inevitably, firm in the earnings down side risk needs to increase equity for managing the operations. It leads to following hypothesis:

Hypothesis 1: Firms with high EDR use more equity financing than debt financing relative to firms with low downside risk.

In order to separate the effect of equity and debt issue, I include two more hypothesis regarding on the effect of EDR on net equity financing and net debt

financing, respectively. As I expect in hypothesis 1, equity issue is expected to be positively associated with EDR, however, debt issue is expected to be negatively associated with EDR. It leads to following hypothesis:

Hypothesis 1a : EDR is positively associated with equity financing.

Hypothesis 1b : EDR is negatively associated with debt financing.

Even though firm constitute their financing almost from external source, it is still other way to raise financing. Firm can raise internal cash in a way that they sell their division as earnings downside risk gets higher. Mulherin and Boone (2000) study the acquisition and divestiture activity in the broad sample size and period. Consistent with the importance of restructuring activity, they find that half of the sample firms are acquired or engage in a major divestiture. As in the prior literature, acquisition and divestiture decision is also associated with financial condition of the firm. When EDR is high, firm need to reconstruct business structure because their earning is not enough to their expectations. To increase internal cash for the purpose of subsequent investment, it seems reasonable to sell a less profitable divestiture. It leads to following hypothesis:

Hypothesis 2: EDR is positively associated with net sales in divestitures.

Firms raise external and internal financing in order to boost their business and to overcome earnings downside risk. They need to properly invest on existing profitable business segment or new bright business. To operate such business, firms retain internal financing resource. In the result of external financing and selling divestitures, the level of cash might be increase. This line of thoughts leads to my third hypothesis, which can be formally stated as follows:

Hypothesis 3: EDR is positively associated with firm's internal cash.

3. MEASURES

3.1 Measurement of earnings downside risk

To measure the main test variable ('Earnings downside risk, EDR), I make an extention of the work of Stone(1973) and Fishburn(1977). According to Dechow (1994) and Dechow et al.(1998), and Roy(1952), Bawa(1975), Kahneman and Tversky(1979), Gul(1991), earnings are asymmetrically distributed and risk mainly manifests in downside states. A payoff's downside volatility, rather than its overall volatility, is a main aspect for valuation of firms under financial distress. This is because common utility functions are concave which captures risk aversion. Investors have a preference with a consumption stream that is steady over time and across states of nature. Because marginal utility loss becomes larger as consumption decreases, an asset value declines if its payoff react positively with

downside consumption change, which dominates the valuation effect of covariation between the payoff of asset and upside consumption change due to decreasing marginal utility. EDR captures the aspects to the downside rather than the overall volatility of the earnings.

Following Konchitchki et al. (2016), I estimate $\mathrm{EDR_{it}}$ for firm i using observations conditioned on fiscal year-end t, adopting the following earnings expectation model to calculate the expected level of earnings:

$$\mathrm{ROA_{it}} = \alpha_0 + \alpha_1\mathrm{ROA_{it-1}} + \alpha_2\mathrm{SALE_{it-1}} + \alpha_3\mathrm{SIZE_{it-1}} + \alpha_4\mathrm{LEVERAGE_{it-1}} + \alpha_5\mathrm{STD\_ROA_{it-1}} + \alpha_6\mathrm{OC_{it-1}} + \varepsilon_{\mathrm{it}} \quad (1)$$

ROA is annual earnings, income before extraordinary items, which is scaled by total assets. SALE is the ratio of total revenues to total assets. LEVERAGE is the ratio of leverage, calculated as long-term plus short-term debts divided by total assets. SIZE is measured as the natural logarithm of market value of equity, referred to firm size. STD_ROA is the standard deviation of ROA estimated over the prior 5 fiscal quarters. OC is operating cycle, measured as the natural logarithm of 360 days multiplied by accounts receivable scaled by total revenues plus inventory scaled by cost of goods sold.

SALE and OC are included following Dechow et al. (1998) as earnings determinants. Following the intuition of Hall and Weiss (1967), Fiegenbaum and

Karnani (1991), and Fenget al. (2015), SIZE is included. ROA volatility (STD_ROA) and prior-period ROA to account for their possible effects on earnings predictability (e.g., Watts and Leftwich 1977; Dechow 1994; Minton et al. 2002; Dichev and Tang 2009). LEVERAGE is included due to its effects on earnings, through the link to financial distress and the provision of external financing to support investments and its operations.

The fitted value from Eq. (1) demonstrates expected earnings, and the estimated residual, $\hat{e}_{it}$ indicates the deviations below ($\hat{e}_{it} < 0$) or above or equal to ($\hat{e}_{it} \geq 0$) the expectation. Therefore, the EDR can be expressed as follows:

$$EDR_{it} = \log\left\{\frac{1 + \left[\left(\frac{1}{N}\right)\sum\left(\hat{\varepsilon}_{it} \times I\hat{\varepsilon}_{it<0}\right)^2\right]^{1/2}}{1 + \left[\left(\frac{1}{N}\right)\sum\left(\hat{\varepsilon}_{it} \times I\hat{\varepsilon}_{it\geq 0}\right)^2\right]^{1/2}}\right\} \quad (2)$$

$I\hat{e}_{it} < 0$ is an indicator variable that equals one if $\hat{e}_{it} < 0$, that is, realized ROA is below its expected level and zero otherwise. $I\hat{e}_{it} \geq 0$ is an indicator equal to one if $\hat{e}_{it} \geq 0$ and zero otherwise. N means the total number of residuals.

To estimate the residuals of the earnings expectation model in Eq. (1), I use ordinary least squares (OLS) regressions of Fama and French (1997) industries over 4-quarter rolling windows, after winsorizing all input variables at the 1st and 99th percentiles of sample distributions.

3.2 Measurement for capital Structure

To find out the effect of EDR on firm's capital structure, I construct six variables. First measure for the relative use of equity and debt is NetIssue which is a measure of the firm's leverage-changing capital market decision at time t, equal to a firm's net equity issuance minus net debt issuance divided by assets. Specifically, net equity issuance is the sale of common and preferred stock minus the purchase of common and preferred stock, and net debt issuance is long-term debt issuance minus long-term debt reduction plus changes in current debt following Kisgen (2009). This measure identifies direct capital market activity decisions of managers (Berger, Ofek, and Yermack (1997), Leary and Roberts (2005), and Kisgen(2006) use a similar measure).

Another measure for the relative equity and debt use is Issue dummy variable. I set the dependent variable, ISSUE, equal to one if a firm's net equity issue constitutes more than 5 percent of total assets and any net debt issue is less than 5 percent, and I set ISSUE equal to zero if a firm's net debt issue constitutes more than 5 percent of total assets and any net equity issue is less than 5 percent following Goe et al (2017). Following prior studies (e.g., Hovakimian, Opler, and Titman 2001; Korajczyk and Levy 2003; Leary and Roberts 2005; Chang et al. 2006, 2009), I use the 5 percent threshold to isolate significant debt or equity issuances that are most likely related to the need for external funding of intended corporate investment. Third, Nequity is to see the separate effect of earnings

downside risk on the firm's equity financing decision, which equals sale of common and preferred stock minus purchase of common and preferred stock divided by total assets. Fourth, Ndebt is to see the separate effect of earnings downside risk on the firm's debt financing decision, which equals long term debt issuance minus long term debt reduction plus changes in current debt divided by total assets. Five, Net_SIV is to see firm's increasing internal cash through the reorganizing, which equals sale of investments minus acquisitions. Last, Cash is internal cash for firm at time t.

4. RESEARCH DESIGN

4.1 Sample

I construct my original sample using US listed firms from 1987 to 2014. Year 1987 is selected because it is the first year for some of main variables in data base. I obtain accounting variables from the Compustat North America Fundamentals Annual File (WRDS: fundamentals) available from Wharton Research Data Services (WRDS). Initial sample includes 179,098 firm-quarter observations with EDR estimates for fiscal year-ends from 1987 to 2015. After constructing main variable, missing variables are deleted before I examine the relation between EDR measure and other experimental variables. Finally, firm that has a change of capital structure is only used to test the capital structure change based on the EDR and my final sample consists of 45,937 firm-quarter observations.

4.2 Validity Test

According to the prediction that EDR represent firm's downside risk, future performance of high EDR firm is less profitable or loss state. To test validity of EDR measure, I examine the relation between EDR and the performance of subsequent period using various earning-based variables by estimating the following multivariate regression model:

$\mathrm{Performance_{it+1}} = \beta_0 + \beta_1\mathrm{EDR_{it}} + \beta_2\mathrm{MB_{it}} + \beta_3\mathrm{MVE_{it}} + \beta_4\mathrm{ROA_{it}} + \beta_5\mathrm{LEVERAGE_{it}} + \beta_5\mathrm{CASH_{it}} + \beta_6\mathrm{ChangeCASH_{it}} + \beta_7\mathrm{Invest\_RD_{it}} + \beta_8\mathrm{Invest\_CAPX_{it}} + \beta_9\mathrm{OO_{it}} +$ year fixed effect + industry fixed effect + firm cluster + ε_{it+1} (3)

Dependent variables consist of five proxy for the future performance. $Performance_{it+1}$ is a variable indicating to the 1-year-ahead earnings-based performance. The following performance measures is adopted following Konchitchki et al. (2016). DLOSS1 is an indicator for negative income before extraordinary items. DLOSS2 is an indicator for negative net income. IBM is the ratio of income before extraordinary items to total revenues. NIM is the ratio of net income to total revenues. OPM is the ratio of operating income after depreciation to total revenues, and GPM is the gross profit margin, calculated as the difference between total revenues and cost of goods sold scaled by total revenues. I employ a

probit estimation method when I use the subsequent loss indicator variables as the dependent variable or OLS when I use the margin measures of subsequent performance as the dependent variable.

To control estimation biases, I follow prior research on profit margins (e.g., Hurdle 1974; Connolly and Hirschey 1984; eftwich al. 2015) and implied sources for downside risk (e.g., Miller and Reuler 1996; Driouchi and Bennett 2010). For control variable, market-to-book ratio, MB; market value of equity, MVE; ROA; LEVERAGE; cash holdings, CASH; changes in cash holdings, ChangeCASH; research and development investment intensity, Invest_RD; capital investment intensity, Invest_CAPX; operating options, OO are included.

4.3 Capital structure change

I examine the relation between EDR and the capital structure change by estimating the following regression model:

$$\text{Capital structure change}_{it+1} = \beta_0 + \beta_1 EDR_{it} + \beta_2 MB_{it} + \beta_3 MVE_{it} + \beta_4 ROA_{it} + \beta_5 LEVERAGE_{it} + \beta_5 CASH_{it} + \beta_6 ChangeCASH_{it} + \beta_7 Invest\_RD_{it} + \beta_8 Invest\_CAPX_{it} + \beta_9 OO_{it} + \text{year fixed effect} + \text{industry fixed effect} + \text{firm cluster} + \varepsilon_{it+1} \quad (4)$$

To control estimation biases, I follow prior research on profit margins (e.g., Hurdle 1974; Connolly and Hirschey 1984; eftwich al. 2015) and implied sources for downside risk (e.g., Miller and Reuler 1996; Driouchi and Bennett 2010). For control variable, market-to-book ratio, MB; market value of equity, MVE; ROA; LEVERAGE; cash holdings, CASH; changes in cash holdings, ChangeCASH; research and development investment intensity, Invest_RD; capital investment intensity, Invest_CAPX; operating options, OO are included.

5 Result

5.1 Descriptive statistics

Table 1 reports the descriptive statistics of variables used in the analysis. Main variable of interest, EDR, has a mean of -0.003 and a median of -0.011, respectively. It is suggesting that the root lower partial moment of unexpected earnings is slightly smaller than the corresponding root higher partial moment. The standard deviation of EDR is 0.043, indicating high variation in downside risk about firm fundamentals. In addition, the signs and magnitudes of the remaining variables are generally consistent with prior research. For example, despite differences in the sample selections and estimation periods, the earnings attributes estimates are largely consistent with the results of Francis et al.(2004). As other examples, the means of earnings volatility, STD_RET, equals 0.128, and which is comparable to those reported by Beaver et al. (1970).

Correlation matrix are represented in panel B of table 1. The results show that EDR is significantly positively correlated with the loss indicators and significantly negatively correlated with the margin variables. These findings indicate that higher EDR firms tend to have worse operating performance over the subsequent year, as expected if the EDR measure is valid.

[Insert Table 1 about here]

5.2 Earnings downside risk and subsequent operating performance

To validity test for the EDR variable, I examine the association between EDR and subsequent operating performance. Table 2 reports results from examining the link of EDR with subsequent earnings based operating performance. The result provides multivariate regression results from estimating Eq. (4) using a probit (OLS) model when the dependent variable is the subsequent loss indicators (margin variables), and it shows that the link between EDR and subsequent underperformance is significant with adding the control variables. Specifically, the estimated coefficients on EDR are highly significant, with positive signs on the loss indicator variables and negative signs on the earnings based margin variables. This coefficients on EDR in Table 2 are consistent with the prediction that EDR captures the expectation for future operating underperformance. Therefore, evidence in

Table 2 supports the validity of the EDR measure as reflecting downside risk in firms' fundamentals.

[Insert Table 2 about here]

5.3 EDR and capital structure change

5.3.1 Equity financing and debt financing

Table 3 presents results of test that shows the relation between EDR and external financing. Panel A in the table 3 shows relative financing decision between equity financing and debt financing. In column 1 and 4, the financing decision between equity and debt is estimated with control variables. With increasing leverage, tax loss carried forward, standard deviation of return, and with decreasing book to market ratio, firm generates equity than debt as an external financing. Regression except EDR measure shows other control variable has similar sign with prior literatures. In column 2 and 5, univariate result regarding on financing decision reveals that coefficient of EDR on NetIssue is positive and statistically significant at 1% level in both regression with amount and dummy variables of capital structure decision. In column 3 and 6, with control variables, coefficient on EDR is also positive and significant also in both regression with amount and dummy variables of capital structure decision. It suggests that when firms has earnings down side risk, issuing equity is more prevalent than issuing debt. Even

though it is known that firms may issue debt at a lower cost than the cost necessary to issue equity, my findings seem to suggest that firms use more expensive financing which is equity financing.

As firms' accounting performance get worse or the accounting profit is below the expected level in succession, cost of debt and cost of equity both increase. Konchitchki et al. (2016) stated that firms in the high EDR decile portfolio have significantly higher subsequent excess returns relative to firms in the low EDR decile portfolio. Increasing cost of debt and cost of equity makes firms to choose their capital structure change. The fact that firms use more equity than debt indicates that firm endure high cost for financing. It can possibly be explained with that as firm's credit rate gets worse, it's hard to borrow money from bank. It is known that bank and financial institution are sophisticated investors, which makes them more conservative for firm which has earning downside risk. Inevitably, firm in the earnings down side risk needs to increase equity for managing the operations. It is consistent with my prediction in hypothesis 1.

In order to separate the effect of equity and debt issue, I examine the effect of EDR on net equity financing and net debt financing, respectively. Panel B in table 3 indicates the result. In column 1, the equity financing decision is estimated only with control variables. It seems that firm increase equity when they are more leveraged, invested in research and development, higher tax loss carried forward, return on equity, deficit, and less book to market ratio, return on asset, dividend. It

shows control variable has similar sign with prior results. In column 2 and 3, EDR on equity financing has 1% significant level of positive coefficient in the regression without control variables and with control variables. It is indicating that high EDR firm issues equity when they needs financing, which is consistent with my prediction in hypothesis 1a. On the other hand, the borrowing situation of the firm is different from those of equity financing. In column 4, the debt financing decision is estimated only with control variables. As decreasing of leverage, standard deviation of return, and increasing of asset, book to market ratio, firm uses debt as an external financing. In the column 5 and 6, the coefficient EDR on net debt issue is not significant anymore both without control variables and with control variables. Even though it is not significant, the direction is opposite of those in equity financing. From the result, I conclude that there's no association between EDR and debt financing. I reject hypothesis 1b.

Overall I confirm the idea that firm with high EDR depends more on equity financing than debt financing.

[Insert Table 4 about here]

5.3.2 Sales divestiture and internal cash

Mulherin and Boone (2000) study the acquisition and divestiture activity in the broad sample size and period. Consistent with the importance of restructuring

activity, they find that half of the sample firms are acquired or engage in a major divestiture. As in the prior literature, acquisition and divestiture decision is also associated with financial condition of the firm. When EDR is high, firm need to reconstruct business structure because their earning is not enough to expectations. To increase internal cash for the purpose of subsequent investment, it seems reasonable to sell a less profitable divestiture. In order to find out firm's decision of divestiture, I construct SIV variable which is net value of sales in divestiture subtracting acquisitions.

Table 4 present the result of the regression on the association between SIV and EDR. In the column 1, high leverage, asset, cash, deficit and less book to market ration, investment in capital asset, return is associated with the decision of sale in divestiture. In the column 2 and 3, the coefficients of EDR on the sales in divestiture are positive and significant at the 1% level both in the regression without control variables and with control variables. It suggests that earning keeps under level of expectation, firm generate financing by selling the division in order to reconstruct their firm structure, which is consistent with my prediction in hypothesis 2.

In the column 5 and 6, internal cash is associated with EDR. The coefficients of EDR on cash are positive and significant at the 1% level. It suggests that firm tries to raise internal cash when earnings downside risk gets higher. In the result of

external financing and selling divestitures, the level of cash increase. It is consistent with my prediction in hypothesis 3.

[Insert Table 5 about here]

6 ADDITIONAL ANALYSIS

6.1 Cross-sectional analysis

There is endogeneity concern that EDR and decision of capital structure is simultaneously affect each other. To mitigate this concern, it is much clear to examine the cross sectional analysis to check what circumstance makes the association between EDR and capital structure change more strongly. Table 5 reports capital structure decision in high EDR firm when it comes to have deficit, DEF, and high growth opportunities. Deficit variable is constructed from an aggregation of dividends, investment, change in working capital and internal cash flows. Market to book ratio is calculated by market value divided by book value. Market to book ratio is generally accepted as a growth opportunity for firm. In the column 1, the coefficient of interaction term, EDR*DEF, on Netissue is positive and significant at the 1% level, indicating that when firm is in the financially deficit situation, they depends more on the equity financing than debt financing. In the column 2, the coefficient of interaction term, EDR*MB, on Netissue is positive and significant at the 1% level, which suggests that firm uses more equity financing

than debt financing especially in the opportunity of high growth. In column 3 and 4, net equity financing is positively associated with deficit and positively associated with MB. In column 5 and 6, however, net debt financing itself is not related with both deficit and high growth opportunity case.

[Insert Table 6 about here]

6.2 Various time construction of EDR measure

In this section, I construct EDR based on the various period to check the robustness of the results. There are positive and significant coefficient of EDR on the Netissue in the 6 to 8 quarter based EDR in the untabulated results. Different period based EDR also support the previous result which is consistent with my hypothesis. In conclusion, there are positive equity financing compared to debt financing when firm is in the high earnings downside risk.

6.3 Endogeneity Issues

Endogeneity is an issue that cannot be ignored yet is difficult to fully address. There may be omitted variables, such as poor performance that directly affect both the earnings downside risk and capital structure change. Causality is also difficult to fully establish. In this paper, I do not assume any direct causality, and stop at association.

To mitigate simultaneity issues as best as possible, I lag all control variables, including firm attributes, and firm performance variables. Without the lag on control variables, it would be difficult to distinguish the impact of EDR and capital structure change from the effect of other variables.

7 Conclusion

Financial statement reveals firms' fundamental risk. Especially when the firms are in the downside risk, firm performance stays below its reasonable expectation. Therefore, following Konchitchki et al. (2016), I construct EDR which measures firm's earnings down side risk using residual from the ROA expectation model. If EDR links to bad outcomes, subsequent performance should be negatively associated with EDR. I find that firms with high EDR tend to have loss and lower profit. And the firms' fundamental risk affect to capital structure. As EDR increases higher, firms depend more heavily on equity financing than debt financing. More specifically, EDR is positively related with equity financing, however, the association is not significant between EDR and debt equity, respectively. Also there is positive association between EDR and divestiture. After all firm increase their internal cash as a result of various financing.

High EDR indicates that firm cannot earn extra profit with current operating system. In other word, the firms which has high EDR need to be more profitable through focusing on the growth potential enterprise. In the trial for the choice and

concentration, firms need financing. In such perspective, financing is very important for firm's survival especially in the downside risk. Through this paper, I make contributions to the literature on determinants of a firm's financing decision by documenting that firms' behavior when they face uncertainty, especially in the form of downside risk. I find that in the earning downside risk firms' capital structure changes toward equity financing.

I acknowledge the examination has caveats. There may exist some unknown factors that simultaneously influence both earnings downside risk and capital structure choice, and the concerns may not be fully eliminated. Also, there is a chance that estimation for earnings downside risk is incomplete. In this case, the measurement error in the test variables may distort the empirical results. Nevertheless, this study has potential to extend future research. Based on financing choice, it is possible that future EDR can increase or decrease. In addition, investment decision might be affected by capital structure change in the earnings downside risk.

Overall it seems to be interesting to see what firms use financing when the firms are in the EDR. This study shed lights on the firm behavior in the EDR. Firms with higher EDR tend to use more equity financing rather than debt financing. The findings lead us to have better understanding of firm behavior.

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APPENDIX
VARIABLE DEFINITIONS

Variable		Description
EDR	=	Proxy for EDR. We calculate it for firm i at the fiscal yearend t as the natural logarithm of the ratio of one plus the root lower partial moment of earnings (Compustat: IB) over total assets (Compustat: AT), which is denoted as Lower, to one plus the root upper partial moment of earnings over total assets, which is denoted as Upper, according to Eqs. (1) and (2) in the text.
DLOSS1	=	An indicator variable that is equal to one if annual income before extraordinary items (Compustat: IB) is negative for firm i in fiscal year t and zero otherwise.
DLOSS2	=	An indicator variable that is equal to one if annual net income (Compustat: NI) is negative for firm i in fiscal year t and zero otherwise.
IBM	=	The ratio of annual income before extraordinary items (Compustat: IB) to total revenues (Compustat: SALE) for firm i in fiscal year t.
NIM	=	The ratio of annual net income (Compustat: NI) to total revenues (Compustat: SALE) for firm i in fiscal year t.
OPM	=	The ratio of annual operating income after depreciation (Compustat: OIADP) to total revenues (Compustat: SALE) for firm i in fiscal year t.
GPM	=	Annual gross profit margin ratio, calculated as the difference between total revenues (Compustat: SALE) and cost of goods sold (Compustat: COGS) divided by total revenues (Compustat: SALE) for firm i in fiscal year t.
MB	=	Market-to-book ratio [Compustat: (PRCC_F*CSHO)/SEQ] for stock i issued at fiscal year-end t.
MVE	=	Market value of equity (Compustat: PRCC_F*CSHO) for stock i at fiscal year-end t.
CASH	=	The ratio of cash holdings and cash equivalents to total assets (Compustat: CHE/AT) for firm i at fiscal year-end t.
ChangeCASH	=	The ratio of changes in cash holdings and cash equivalents to total assets (Compustat: CHCHE/AT) for firm i at fiscal year-end t.
Invest_CAPX	=	The ratio of capital expenditures to total assets (Compustat: CAPX/ AT) for firm i at fiscal year-end t.
Invest_RD	=	The ratio of R&D expenditures to total assets (Compustat: XRD/AT) for firm i at fiscal year-end t.
Leverage	=	The ratio of the sum of interest-bearing long-term and short-term debts to total assets (Compustat: (DLTT + DLC)/AT) of firm i at fiscal year-end t..
NetDiss	=	Firm's net debt issuance minus net equity issuance divided by assets. Specifically, net debt issuance is long-term debt issuance minus long-term debt reduction plus changes in current debt, and net equity issuance is the sale of common and preferred stock minus the purchase of common and preferred stock.

TABLE 1: Data Descriptions

Variables	Mean	Std.	Min.	1st quartile	Median	3rd quartile	Max.
EDR	-0.003	0.043	-0.077	-0.027	-0.011	0.008	0.176
NetIss	0.005	0.071	-0.181	0.000	0.000	0.002	0.470
Ndebt_issue	0.001	0.021	-0.091	0.000	0.000	0.000	0.114
NEquity_issue	0.009	0.076	-0.142	0.000	0.000	0.004	0.502
ISSUE	0.696	0.460	0.000	0.000	1.000	1.000	1.000
DLOSS1	0.286	0.452	0.000	0.000	0.000	1.000	1.000
DLOSS2	0.290	0.454	0.000	0.000	0.000	1.000	1.000
IBM	-0.194	1.114	-8.657	-0.020	0.039	0.089	0.406
NIM	-0.198	1.131	-8.772	-0.023	0.039	0.090	0.446
OPM	-0.161	1.107	-8.560	-0.012	0.064	0.132	0.437
GPM	0.307	0.621	-4.540	0.227	0.369	0.540	0.886
ROA	-0.002	0.062	-0.337	-0.005	0.012	0.026	0.088
LEV	0.119	0.160	0.000	0.000	0.010	0.225	0.623
Cash	0.231	0.216	0.000	0.045	0.166	0.364	0.823
ChangeCash	-0.005	0.097	-0.398	-0.033	-0.001	0.026	0.337
Invest_RD	0.014	0.025	0.000	0.000	0.000	0.020	0.131
Invest_CAPAX	0.036	0.045	0.000	0.009	0.021	0.045	0.252
OO	0.517	0.387	0.032	0.222	0.423	0.719	1.956
Target_Gap	0.073	0.152	-0.401	-0.006	0.099	0.181	0.330
LNASSET	4.940	2.092	0.783	3.408	4.778	6.288	10.309
MB	0.632	0.536	-0.074	0.278	0.489	0.818	3.107
CRATE	0.154	0.361	0.000	0.000	0.000	0.000	1.000
ZSCORE	0.487	2.214	-11.225	0.339	1.042	1.596	2.586
TLCF	0.246	0.811	0.000	0.000	0.000	0.037	5.191
Dividend	0.007	0.015	0.000	0.000	0.000	0.007	0.080
RET	0.034	0.283	-0.585	-0.126	0.011	0.157	1.173
Std_ret	0.128	0.107	0.008	0.056	0.098	0.165	0.608
DEF	0.022	0.124	-0.222	-0.039	0.002	0.051	0.628

This table shows the descriptive statistics of variables used in the analysis. Main variable of interest, EDR, has a mean of -0.003 and a median of -0.011, respectively. It is suggesting that the root lower partial moment of unexpected earnings is slightly smaller than the corresponding root higher partial moment. The standard deviation of EDR is 0.043, indicating high variation in downside risk about firm fundamentals

TABLE 2: EDR Validity Test

Variables	Y=DLOSS1			Y=DLOSS2			Y=IBM			Y=OPM			Y=GPM			Y=NIM		
	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.
Intercept	-0.84		-1.47	-1.11	*	-1.92	-0.49	**	-1.79	-0.45	*	-1.66	0.18		1.03	-0.50		-1.78
EDR	28.84	***	38.42	28.60	***	38.49	-9.15	***	-22.55	-9.00	***	-21.82	-3.53	***	-13.86	-9.22	***	-22.57
MB	-0.29	***	9.3	-0.29	***	9.29	0.00		0.15	0.01		-0.26	0.00		-0.1	0.00		0.01
MVE	0.00	**	-2.16	0.00	**	-1.97	0.00		-0.11	0.00		0.3	0.00		1.53	0.00		0
ROA	-3.05	***	-10.54	-3.00	***	-10.43	1.67	***	7.61	1.78	***	7.99	0.78	***	6.2	1.68	***	7.62
LEV	2.06	***	13.92	2.08	***	14.38	-0.21	***	-3.66	-0.07		-1.19	-0.12	**	-3.18	-0.22	***	-3.82
cash	1.13	***	10.04	1.11	***	9.98	-0.60	***	-7.29	-0.69	***	-7.71	-0.16	**	-3.17	-0.61	***	-7.33
ChangeCash	-0.45	***	-3.14	-0.49	***	-3.4	0.01		0.16	0.02		0.23	-0.09		-1.47	0.02		0.24
Invest_RD	4.30	***	4.65	4.22	***	4.61	-2.73	***	-3.61	-2.80	***	-3.6	-1.58	***	-2.77	-2.77	***	-3.66
Invest_CAPAX	-1.09	**	-3.16	-1.05	***	-3.06	-0.45	**	-2.45	-0.42	**	-2.22	0.03		0.23	-0.45	**	-2.42
OO	-0.02		-0.33	-0.03		-0.58	0.02		0.61	0.03		0.8	-0.03		-1.41	0.02		0.63
STD_RET	0.78	***	6.01	0.76	***	5.9	-0.17	***	-2.76	-0.15	**	-2.36	-0.02		-0.56	-0.17	***	-2.74
N	45,937			45,937			45,937			45,937			45,937			45,937		
Adjusted R2							0.27			0.28			0.18			0.26		
Year fixed	yes			yes			yes			yes			yes			yes		
Firm cluster	yes			yes			yes			yes			yes			yes		

This table shows results from examining the link of EDR with subsequent earnings based operating performance. The result provides multivariate regression results from estimating Eq. (4) using a probit (OLS) model when the dependent variable is the subsequent loss indicators (margin variables), and it shows that the link between EDR and subsequent underperformance is significant with adding the control variables. *, **, and *** denote statistical significance between the two subsamples at the 10%, 5%, and 1% levels, respectively. Variable definitions are provided in Appendix.

TABLE 3: EDR and Equity versus Debt financing

Panel A EDR and Equity versus Debt financing

Related Hypo	H1																	
Variables	Y=NetIssue												Y=Issue_dummy					
	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.
Intercept	0.00		0.16	0.01		1.34	0.01		0.76	-0.38		-0.21	0.05		0.03	-0.20		-0.12
EDR				0.36	***	14.81	0.24	***	11.79				9.07	***	7.91	3.93	***	3.33
NetEquityIssue																		
NetDebtIssue																		
Target_Gap	0.03	***	6.57				0.02	***	6.38	3.07	***	7.95				3.09	***	7.89
Lnasset	0.00		-1.17				0.00	**	-1.99	-0.15	***	-5.11				-0.15	***	-5.13
MB	-0.01	***	-8.45				-0.01	***	-9.37	-0.24	**	-3.2				-0.24	**	-3.2
ROA	-0.05	***	-3				0.01		0.5	-0.33		-0.2				0.24		0.31
cash	0.00		0.85				0.00		1.15	1.89	***	6.41				1.83	***	6.31
CRATE	0.00	***	-3.27				0.00		-1.04	0.01		0.12				0.05		0.36
ZSCORE	0.00	***	-3.1				0.00	***	-3.31	-0.01		-0.03				0.00		-0.08
Invest_CAPAX	0.01		0.45				0.01		1.37	-0.56		-1.09				-0.76		-0.89
Invest_RD	0.10		2.44				0.08	**	2.12	1.14		0.43				0.46		0.23
TLCF	0.01	***	5.77				0.00	***	2.86	0.51	***	4.64				0.40	***	3.86
DIVIDEND	-0.06	*	-1.97				-0.04		-1.18	-5.36		-1.52				-5.64		-1.56
RET	0.01	***	5.3				0.01	***	4.76	0.13		0.96				0.12		0.88
STD_RET	0.01	***	3.1				0.01	***	3.07	0.85	**	2.34				0.86	**	2.34
DEF	0.03	***	7.82				0.03	***	6.48	-0.24		0.09				-0.05		-0.15
N	45,937			45,937			45,937			5,283			5,283			5,283		
Adjusted R2	0.09			0.07			0.10											
Year fixed	yes			yes			yes			yes			yes			yes		
Industry fixed	yes			yes			yes			yes			yes			yes		
Firm cluster	yes			yes			yes			yes			yes			yes		

This table shows results of test that shows the relation between EDR and external financing. Panel A in the table 3 shows relative financing decision between equity financing and debt financing. *, **, and *** denote statistical significance between the two subsamples at the 10%, 5%, and 1% levels, respectively. Variable definitions are provided in Appendix.

TABLE 3 (continued)

Panel B EDR and Equity versus Debt financing

Related Hypo	H1 a								H1 b							
	Y=Nequity								Y=Ndebt							
Variables	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.
Intercept	0.00		-0.17	0.01		0.87	0.01		0.79	0.00		0.21	0.00		-0.2	0.00		0.19
EDR				0.55	***	18.08	0.39	***	14.9				0.00		0.12	0.00		-0.53
NetEquityIssue										0.00		0.55				0.00		0.57
NetDebtIssue	0.00			0.49			0.00		0.37									
Target_Gap	0.01	**		1.56			0.00		1	-0.02	***	-10.65				-0.01	***	-10.63
Lnasset	0.00			0.56			0.00		-0.71	0.00	**	2.74				0.00	***	2.76
MB	-0.01	***		-8.69			-0.01	***	-10.26	0.00	**	2.08				0.00	**	2.1
ROA	-0.06	***		-3.48			0.03	**	1.97	0.00		0.03				0.00		-0.15
cash	0.00			0.41			0.00		0.87	0.00		-0.15				0.00		-0.17
CRATE	-0.01	***		-9.26			-0.01	***	-6.08	0.00	***	-3.66				0.00	***	-3.71
ZSCORE	0.00	**		-2.43			0.00	***	-2.72	0.00		0.32				0.00		0.33
Invest_CAPAX	0.02			1.22			0.03	***	2.62	0.00		-0.12				0.00		-0.16
Invest_RD	0.09	**		2.09			0.06		1.56	-0.01		-1.34				-0.01		-1.31
TLCF	0.01	***		7.86			0.01	***	3.82	0.00		1.13				0.00		1.29
DIVIDEND	-0.07	**		-2.33			-0.03		-1.07	0.01		1.83				0.01	**	1.77
RET	0.01	***		6.29			0.01	***	5.56	0.00		0.46				0.00		0.48
STD_RET	0.01	***		2.91			0.01	***	2.87	0.00	**	-2.31				0.00	**	-2.31
DEF	0.04	***		8.18			0.03	***	6.02	0.00	***	3.04				0.00	***	3.07
N	45,937			45,937			45,937			45,937			45,937			45,937		
Adjusted R2	0.11			0.12			0.14			0.02			0.01			0.02		
Year fixed	yes			yes			yes			yes			yes			yes		
Industry fixed	yes			yes			yes			yes			yes			yes		
Firm cluster	yes			yes			yes			yes			yes			yes		

*, **, and *** denote statistical significance between the two subsamples at the 10%, 5%, and 1% levels, respectively. Variable definitions are provided in Appendix.

TABLE 4: EDR and sales in divestiture and cash

Panel A EDR and sales in divestiture

Related Hypo	H2								
Variables	**Y=Net_SIV**								
	Coefficient		**t-stat.**	**Coefficient**		**t-stat.**	**Coefficient**		**t-stat.**
Intercept	-0.04	***	-3.77	-0.02	***	-1.73	-0.04	***	-3.71
EDR				0.04	***	2.19	0.04	***	2.57
Target_Gap	0.06	***	11.31				0.06	***	11.27
Lnasset	0.00	***	4.21				0.00	***	4.14
MB	0.00	**	-1.89				0.00	**	-2.05
ROA	-0.01		-0.47				0.00		0.25
cash	0.02	***	4.21				0.02	***	4.24
CRATE	0.00	**	1.9				0.00	**	2.13
ZSCORE	0.00		0.22				0.00		0.2
Invest_CAPAX	-0.03	***	-3.73				-0.03	***	-3.6
Invest_RD	0.02		0.47				0.02		0.4
TLCF	0.00		0.65				0.00		-0.12
DIVIDEND	0.01		0.15				0.02		0.22
RET	0.00	**	-2.2				0.00	**	-2.32
STD_RET	0.00		-0.51				0.00		-0.52
DEF	0.00		1.33				0.00		1.07
N	45,937			45,937			45,937		
Adjusted R2	0.05			0.66			0.05		
Year fixed	yes			yes			yes		
Industry fixed	yes			yes			yes		
Firm cluster	yes			yes			yes		

This table shows the result of the regression on the association between SIV and EDR. In the column 1, high leverage, asset, cash, deficit and less book to market ration, investment in capital asset, return is associated with the decision of sale in divestiture. In the column 2 and 3, the coefficients of EDR on the sales in divestiture are positive and significant at the 1% level both in the regression without control variables and with control variables. In the column 5 and 6, internal cash is associated with EDR. The coefficients of EDR on cash are positive and significant at the 1% level. *, **, and *** denote statistical significance between the two subsamples at the 10%, 5%, and 1% levels, respectively. Variable definitions are provided in Appendix.

TABLE 4 (Continued)

Panel B EDR and internal cash

Related Hypo	H3								
Variables	Y=Cash								
	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.
Intercept	0.06		1.55	0.28	***	7.1	0.07		1.69
EDR				0.43	***	6.77	0.23	***	6.63
Target_Gap	0.17	***	18.95				0.16	***	18.95
Lnasset	0.00	***	-5.13				0.00	***	-5.5
MB	0.00	**	2.75				0.00		2.3
ROA	0.06	***	3.04				0.11	***	5.2
cash	0.65	***	65.07				0.65	***	65.12
CRATE	-0.01	*	-1.56				0.00		-0.9
ZSCORE	0.00	**	2.17				0.00	**	2.14
Invest_CAPAX	-0.12	***	-6.71				-0.12	***	-6.24
Invest_RD	-0.01		-0.05				-0.02		-0.32
TLCF	0.02	***	9.49				0.01	***	7.63
DIVIDEND	0.08		1.1				0.11		1.42
RET	0.00		0.67				0.00		0.36
STD_RET	0.01		0.93				0.01		0.9
DEF	-0.01		-2.46				-0.02		-3.38
N	45,937			45,937			45,937		
Adjusted R2	0.66			0.66			0.66		
Year fixed	yes			yes			yes		
Industry fixed	yes			yes			yes		
Firm cluster	yes			yes			yes		

*, **, and *** denote statistical significance between the two subsamples at the 10%, 5%, and 1% levels, respectively. Variable definitions are provided in Appendix.

TABLE 5: Additional Analysis

Panel A Additional Analysis

Related Hypo	H1						H1 a						H1 b					
Variables	**Y=NetIssue**						**Y=Nequity**						**Y=Ndebt**					
	Coefficient		**t-stat.**	**Coefficient**		**t-stat.**	**Coefficient**		**t-stat.**	**Coefficient**		**t-stat.**	**Coefficient**		**t-stat.**	**Coefficient**		**t-stat.**
Intercept	0.01		0.75	0.01		0.61	0.01		0.78	0.01		0.62	0.00		0.19	0.00		0.2
EDR	0.20	***	10.01	0.36	***	12.03	0.35	***	13.54	0.52	***	14.93	0.00		-0.68	0.00		-0.6
EDR*DEF	0.62	***	5.44				0.48	***	4.02				0.01		0.87			
EDR*MB				0.21	***	7.91				0.23	***	8.08				0.00		0.31
NetDebtIssue							0.00		0.19	0.00		0.3						
NetEquityIssue													0.00		0.55	0.00		0.58
Target_Gap	0.02	***	5.59	0.03	***	6.63	0.00		0.22	0.00		1.28	-0.01	***	-10.65	-0.01	***	-10.64
Lnasset	0.00	**	-2.4	0.00	*	-1.83	0.00		-1.04	0.00		-0.51	0.00	***	2.73	0.00	***	2.76
MB	-0.01	***	-8.82	-0.01	***	-9.19	-0.01	***	-9.85	-0.01	***	-10.16	0.00	**	2.15	0.00	**	2.1
ROA	0.02		1.35	0.01		0.78	0.03	***	2.66	0.03	**	2.28	0.00		-0.07	0.00		-0.16
cash	0.00		0.6	0.00		1.35	0.00		0.46	0.00		1.08	0.00		-0.23	0.00		-0.18
CRATE	0.00		-1.4	0.00		-1.18	-0.01	***	-6.4	-0.01	***	-6.26	0.00	***	-3.72	0.00	***	-3.7
ZSCORE	0.00	***	-3.27	0.00	***	-3.25	0.00	***	-2.68	0.00	***	-2.63	0.00		0.36	0.00		0.31
Invest_CAPAX	0.02	*	1.84	0.02		1.62	0.03	***	2.98	0.03	***	2.88	0.00		-0.12	0.00		-0.16
Invest_RD	0.07	*	1.85	0.07	**	1.93	0.05		1.34	0.05		1.33	-0.01		-1.36	-0.01		-1.29
TLCF	0.00	***	2.61	0.00	***	2.73	0.01	***	3.63	0.01	***	3.7	0.00		1.24	0.00		1.3
DIVIDEND	-0.04		-1.4	-0.02		-0.76	-0.04		-1.24	-0.02		-0.61	0.01	**	1.75	0.01	*	1.75
RET	0.01	***	4.59	0.01	***	4.59	0.01	***	5.43	0.01	***	5.39	0.00		0.46	0.00		0.49
STD_RET	0.01	***	3.36	0.01	***	3.51	0.01	***	3.08	0.01	***	3.32	0.00	**	-2.29	0.00	**	-2.33
DEF	0.02	***	5.09	0.03	***	6.18	0.02	***	5.11	0.03	***	5.66	0.00	***	2.86	0.00	***	3.08
N	45,937			45,937			45,937			45,937			45,937			45,937		
Adjusted R2	0.11			0.11			0.14			0.14			0.02			0.02		
Year fixed	yes			yes			yes			yes			yes			yes		
Industry fixed	yes			yes			yes			yes			yes			yes		
Firm cluster	yes			yes			yes			yes			yes			yes		

*, **, and *** denote statistical significance between the two subsamples at the 10%, 5%, and 1% levels, respectively. Variable definitions are provided in Appendix.

TABLE 5 (Continued)

Panel B Additional Analysis

Related Hypo	H4						H5					
Variables	Y=Net_SIV						Y=Cash					
	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.	Coefficient		t-stat.
Intercept	-0.04	***	-3.9	-0.04	***	-3.69	0.06		1.59	0.06		1.58
EDR	0.02		1.17	0.00		0.72	0.13	***	2.93	0.20	***	4.98
EDR*DEF	0.03		0.64				0.61	***	7.66			
EDR*MB				0.04	**	2.28				-0.04	*	-1.23
Target_Gap	0.06	***	11.58	0.06	***	11.24	0.17	***	18.74	0.17	***	19.27
Lnasset	0.00	***	4.14	0.00	***	4.12	0.00	***	-5.81	0.00	***	-5.44
MB	0.00	**	-2.25	0.00	**	-2.18	0.00	**	2.51	0.00	**	2.09
ROA	0.00		0.37	0.00		0.18	0.12	***	6.1	0.11	***	5.34
DLOSS2	0.00	***	3.59	0.00	***	4.22	0.01	***	6.28	0.01	***	5.58
cash	0.02	***	4.07	0.02	***	2.15	0.65	***	64.6	0.65	***	64.93
CRATE	0.00	**	2.38	0.00	**	0.17	0.00		-0.67	0.00		-0.55
ZSCORE	0.00		0.24	0.00		-3.65	0.00	**	2.42	0.00	**	2.21
Invest_CAPAX	-0.03	***	-3.46	-0.03	***	0.45	-0.11	***	-5.63	-0.11	***	-6.04
Invest_RD	0.01		0.33	0.02		-0.06	-0.04		-0.78	-0.03		-0.44
TLCF	0.00		-0.37	0.00		0.17	0.01	***	6.99	0.01	***	7.31
DIVIDEND	0.02		0.29	0.02		-2.28	0.12		1.51	0.12		1.65
RET	0.00	**	-2.24	0.00	**	-0.62	0.00		0.32	0.00		0.46
STD_RET	0.00		-0.65	0.00		1.17	0.01		0.91	0.01		0.75
DEF	0.00		0.75	0.00		0.75	-0.04	***	-5.32	-0.02	**	-3.63
N	45,937			45,937			45,937			45,937		
Adjusted R2	0.11			0.11			0.14			0.14		
Year fixed	yes			yes			yes			yes		
Industry fixed	yes			yes			yes			yes		
Firm cluster	yes			yes			yes			yes		

*, **, and *** denote statistical significance between the two subsamples at the 10%, 5%, and 1% levels, respectively. Variable definitions are provided in Appendix.

국문초록

최근의 재무 및 회계연구에서는 불확실성에 따른 기업의 행동변화에 대하여 활발히 연구하고 있다. 주가 변동성 및 주가 하락위험이 있는 경우의 기업의 의사결정에 대한 연구가 이루어지고 있기는 하지만 회계정보를 이용한 연구는 아직 부족한 실정이다. 특히 이익이 하락할 위험이 있는 경우 기업들의 자본구조 변경에 대하여 명확히 알려진 바가 없다. 이 논문에서는 이익하락위험이 있는 경우에 기업의 자본구조 변경 의사결정에 대하여 연구를 진행하였다. 연구 결과에 따르면, 이익 하락 위험이 있는 경우 기업들은 부채보다는 자본발행을 통하여 자본구조를 변경하며 사업부의 매각을 통하여 내부현금보유를 늘리는 것으로 확인되었다.

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