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경영학석사학위논문

Income Smoothing and Value of
Corporate Cash Holdings

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Income Smoothing and Value of Corporate Cash Holdings

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Abstract

Income Smoothing and Value of Corporate Cash Holdings

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This study examines the effect of income smoothing on the market value of an additional dollar in cash holdings. I find that income smoothing negatively affects the marginal shareholder value of cash holdings. I also find that the effect of income smoothing on the value of cash holdings is more severe in firms with weak corporate governance. This result can be interpreted as that income smoothing garbles information in earnings, so aggravated information asymmetry from income smoothing discounts liquid assets in the firm. The result is robust after controlling various definitions of cash holdings and corporate governance.

Keywords: Income smoothing, cash holdings, information asymmetry, corporate governance

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I. Introduction

In this paper, I investigate the informative role of income smoothing on the equity investors' wealth in the context of corporate cash holdings. Income smoothing represents the manager's attempts to use their reporting discretion to reduce the fluctuations of the firm's consecutive earnings realizations. Although income smoothing has been widely documented for decades, its effects on accounting information quality and outside shareholders' wealth are not yet fully explored. On the one hand, income smoothing improves information quality of accounting earnings if managers use their discretion to communicate their private assessment of future earnings (Tucker and Zarowin 2006). On the other hand, income smoothing makes earnings noisier if managers intentionally distort the reported earnings (Healy 1985). Looking into which effect is more dominant in a cross-sectional setting is an open, empirical question (Dechow et al. 2010). This study adds new evidence to this debate by utilizing a new approach with corporate cash holdings to scrutinize the informative role of income smoothing on shareholder wealth.

Corporate cash holdings provide a unique setting to manifest the informative role of income smoothing by focusing on the valuation of firm-specific assets. If the company's information environment improves or worsens due to a certain accounting practice, the valuation of firm-specific assets increases or decreases because the information environment affects investment efficiency. Specifically, the firm's information opaqueness significantly influences the value of liquid assets due to their unique characteristics. Thus, corporate cash holdings can be employed to test the

informative role of accounting practices, such as income smoothing.

Concerning the corporate cash holdings, recent studies find that the market value of an additional dollar in cash holdings is less than one dollar because of the agency motive of cash holdings (Faulkender and Wang 2006; Dittmar and Mahrt-Smith 2007). This finding is consistent with the free cash flow hypothesis, which suggests that free cash flows affect the efficiency of investment decisions negatively due to agency problems (Jensen 1986). Based on this argument, recent accounting research depends on cash holdings to display the informative role of various accounting practices. (Louis et al. 2012; Sun et al. 2012; Huang and Zhang 2011). Better accounting quality mitigates the agency problem, thereby increasing the marginal value of cash holdings for shareholders. If an accounting practice makes the firm's information environment opaque, intensified agency concerns lower the marginal value of cash holdings. Therefore, the informative role of accounting practices, such as income smoothing, can be tested in the context of the marginal value of cash holdings for equity investors.

From the marginal value of cash holdings test, I find that income smoothing reduces the marginal value of cash holdings. This result is robust after controlling various definitions of cash holdings, corporate governance, and earnings quality. This result can be interpreted as a discount of market value due to higher information asymmetry for firms with high income smoothing. In addition, I find that the effect of income smoothing on the value of cash holdings is alleviated when the firm's governance is strong. This evidence supports the hypothesis that income smoothing reduces the value of cash holdings by aggravating information asymmetry problem

between firm insiders and outsiders.

This study contributes to the literature by providing empirical evidence that income smoothing is not a desired attribute in accounting. Though income smoothing is very prevalent, as Graham et al. (2005) report, the issue on whether it is beneficial is not yet concluded. I attempt to add evidence on whether income smoothing improves the informativeness of accounting or distorts information. Also, this study supports the fact that even in the U.S., which is characterized by low private benefits extraction threats, discretionary income smoothing deteriorates shareholder wealth by aggravating agency problems. This evidence sheds light on earnings management literature as well.

In section II, I summarize related prior literature and develop my hypotheses. In section III, I explain my research design, including the measure of income smoothing and the empirical model. Section IV explains empirical results, and Section V offers general conclusions.

II. Literature Review and Hypotheses Development

Income smoothing is defined as the practice that is used to reduce fluctuations in the level of earnings that is considered normal for a firm (Beidleman 1973). Since accounting rules are basically designed to present a smooth stream of earnings by smoothing out fluctuations in cash flows (Dechow 1994), income smoothing is not a new issue in accounting literature. Indeed, intentional income smoothing is very pervasive. For example, Graham et al. (2005) indicate that corporate executives prefer

reporting smooth earnings paths, holding cash flow volatility constant.¹ This field study suggests that the most popular motivations for income smoothing are (1) lowering the firm's risk perceived by investors, (2) negotiating better terms of trade with customers and suppliers, and (3) conveying future growth prospects to investors.

However, accounting literature still does not reach an agreement as to whether income smoothing is a desirable property of accounting earnings. Specifically, recent research has categorized it as either (1) distorting or (2) facilitating efficient communication of insiders' private information. If income smoothing distorts the communication, earnings become less informative. For instance, meeting the bonus target (Healy 1985) or protecting their job (Fudenberg and Tirole 1995; Arya et al. 1998) can be motives to smooth reported earnings for managers. The level of information asymmetry is higher either when earnings are smoother or more volatile than cash flows (Jayaraman 2008). Leuz et al. (2003) and Bhattacharya et al. (2003) assume that insiders use earnings smoothing to obfuscate their consumption of private control benefits. Firms with more insider control exhibit relatively more income smoothing than non-insider controlled firms, especially in countries with poor investor protection (Gopalan and Jayaraman 2012).

On the contrary, Subramanyam (1996) finds that discretionary accruals are positively associated with future earnings and operating cash flows, and thus returns are positively associated with contemporaneous discretionary accruals. If discretionary accruals convey information about firms' future prospects, the use of discretionary

¹ "An overwhelming 96.9% of the survey respondents indicate that they prefer a smooth earnings path." (Graham et al. 2005)

accruals to smooth reported income make earnings more informative. Kirschenheiter and Melumad (2002) show that managers implement income smoothing because investors' confidence in the inferred permanent component of earnings shrinks when reported income fluctuates. Tucker and Zarowin (2006) show that income smoothing is associated with more informative earnings using the future earnings response coefficient from Collins et al. (1994). These studies view income smoothing as a medium for managers to express their private information about the firms' economic conditions. In sum, the literature on the effects of income smoothing still does not yield a consensus as to whether it improves communication between insiders and outsiders and whether it lowers firm risk perceived by outside investors.²

The income smoothing literature is growing to elucidate how income smoothing influences firm valuation factors such as cost of capital and investment efficiency. If income smoothing conveys managers' private information for low risk and growth potential, cost of capital declines as income is smoothed. In contrast, cost of capital increases if income smoothing contaminates the information quality of earnings. It is not surprising that empirical evidence on the cost of capital is mixed here as the debate on the informative role of income smoothing is not yet conclusive. For example,

² Even though many cross-country tests suggest that income smoothing reflects managers' discretion and is negatively correlated with impediments to earnings management (Leuz et al. 2003; Bhattacharya et al. 2003; Biddle and Hilary 2006; Gopalan and Jayaraman 2012; Lang et al. 2012)), a large number of studies within U.S. tend to exhibit that income smoothing has some positive effects for the firm (Subramanyam 1996; Kirschenheiter and Melumad 2002; Tucker and Zarowin 2006). In order to explain this discrepancy, Amiram and Owens (2012) exhibit that discretionary smoothing decreases cost of debt within low extraction threat environments whereas it increases cost of debt within environments where the ability of insiders to extract private benefits is less well controlled. However, in this paper, I focus on the U.S. capital market in which risks for private benefits would be relatively low to test the effects of income smoothing.

Francis et al. (2004) document a negative relation between earnings smoothness and the implied cost of capital, suggesting that managers take advantage of income smoothing as a tool to mitigate risk. On the contrary, McInnis (2010) uses realized return as the proxy for the cost of capital and offers evidence that smooth earnings do not lead to a lower cost of equity capital.

In addition to the cost of capital, investment efficiency is a popular topic examined in recent studies since this important component influences the firm's valuation directly. The growing amount of literature suggests that because opaque firms tend to invest in suboptimal projects compared to transparent firms, accounting information quality influences investment efficiency through less information asymmetry and effective monitoring. Biddle and Hilary (2006) are among the first to analyze this subject by finding that accounting information quality significantly relates to firm-level capital investment efficiency. They suggest that a higher quality of accounting reduces information asymmetry between insiders and outside suppliers of capital, and thus boosts investment efficiency. Biddle et al. (2009) supplement Biddle and Hilary (2006) findings by showing that one of the channels linking reporting quality and investment efficiency is a reduction of friction such as moral hazard and adverse selection that hampers efficient investment. While the investment efficiency literature pays attention mainly to accruals quality such as the one derived from Dechow and Dichev (2002), examining the effects of income smoothing on investment efficiency will be interesting as well.

In prior literature, Biddle and Hilary (2006) suggest that earnings smoothness

increases the investment-cash sensitivity at the firm level within a cross-country setting. Lang et al. (2012) use income smoothing as a proxy for firms' information opaqueness to analyze firms' information transparency and exhibit that firms with less income smoothing benefited from high liquidity and firm valuation. In contrast, Huang (2011) asserts that income smoothing improves investment efficiency, which is measured by investment sensitivity to stock price.³ In short, little is known about the effects of income smoothing on cost of capital and investment efficiency.

In this study, I employ the equity market value of corporate cash holdings as a vehicle to investigate the informative role of income smoothing.⁴ Corporate cash holdings provide a unique setting to examine the informative role of income smoothing. For corporate cash holdings, recent studies find that the market value of an additional dollar in cash holdings is less than one dollar due to the agency motive of cash holdings (Faulkender and Wang 2006; Dittmar and Mahrt-Smith 2007). This finding is consistent with the free cash flow hypothesis, which suggests that free cash flows affect the efficiency of investment decisions negatively due to agency problems (Jensen 1986). In this line of literature, Dittmar and Mahrt-Smith (2007) show that cash is worth less in a poorly governed firm. Harford et al. (2008) provide evidence that entrenched managers tend to build excess cash holdings but waste the excess cash quickly.

³ Disagreement exists here as well. While studies conducted in cross-country setting, such as Biddle and Hilary (2006) and Lang et al. (2012), suggest that income smoothing causes negative consequences, Huang (2011) focuses on the U.S. capital markets and exhibits positive effects of income smoothing.

⁴ Therefore, this study is in the line of literature that focuses on the relation between accounting quality and firm valuation.

Using the agency motive of cash holdings, recent accounting research attempts to unveil the informative role of various accounting practices. If the improved quality of accounting information alleviates the agency problem related to liquid assets, the marginal value of cash holdings for shareholders increases. For example, Louis et al. (2012) state that accounting conservatism provides incentives for ex ante efficient investment decisions and facilitates ex post monitoring of managers' investment decisions, thereby mitigating the value destruction associated with cash holdings. Huang and Zhang (2011) show evidence that extensive disclosure enhances the value of cash assets because it restricts the insiders' abilities to utilize corporate resources. Sun et al. (2012) argue that poor earnings quality exacerbates information asymmetry between internal and external stakeholders of a firm, and thus agency considerations about the exploitation of funds reduce the value of corporate cash holdings.

In this line of research, value of cash holdings can be utilized to reveal the informative role of income smoothing. If managers convey private information through income smoothing, or in other words, if managers rely on income smoothing to mitigate agency problems, income smoothing reduces the information gap in the firms' future cash flows between managers and outside capital suppliers. Thus, the marginal value of cash holdings increases when firms engage in more income smoothing. Conversely, if income smoothing exacerbates the information quality of earnings, the market value of cash holdings is likely to be discounted due to agency concerns. This hypothesis can be tested empirically since the marginal value of cash holdings can be calculated using the model from Faulkender and Wang (2006). Specifically, I could

explore the effects of income smoothing on the marginal value of cash holdings by adding income smoothing and an interaction term of income smoothing with the change in cash holdings as additional explanatory variables. My two-sided hypothesis, therefore, is as follows:

H1a: Ceteris paribus, the extent to which the firm smoothes its earnings will reduce the marginal value of cash holdings.

H1b: Ceteris paribus, the extent to which the firm smoothes its earnings will increase the marginal value of cash holdings.

Also, if the effect of income smoothing is due to information asymmetry, good corporate governance will mitigate the problem. In this light, I hypothesize the effect of corporate governance:

H2: The change in the value of cash holdings from income smoothing will be higher in firms with weak corporate governance.

III. Research Design

In this section, I describe the computation of the measure of income smoothing that I use in the empirical tests. I follow the approach applied in Lang et al. (2012) and Amiram and Owens (2012) to measure income smoothing. First, I compute two

alternative measures of overall earnings smoothness for firm i in period t , which I denote $SMTH1_{i,t}$ and $SMTH2_{i,t}$. $SMTH1_{i,t}$ is the negative value of the ratio of the standard deviation of operating earnings to the standard deviation of operating cash flows. This is calculated over the five-year period ending in year t , where both earnings and cash flows are scaled by lagged total assets prior to the computation of the standard deviations. Larger values of $SMTH1_{i,t}$ indicate more income smoothing. $SMTH2_{i,t}$ is the negative value of the correlation between accruals and operating cash flows both scaled by lagged total assets over the five-year period ending in year t , where higher values of $SMTH2_{i,t}$ indicate more earnings smoothness.

Next, I construct the firm-year measure of income smoothing, $SMTH_{i,t}$, as the average of percentile rank values of $SMTH1_{i,t}$ and $SMTH2_{i,t}$ for firm i :

$$SMTH_{i,t} = \left(PCTILE_{SM\ TH\ 1_{i,t}} + PCTILE_{SM\ TH\ 2_{i,t}} \right) \div 100 / 2 \quad (1)$$

By construction, $PCTILE_SMTH1_{i,t}$ and $PCTILE_SMTH2_{i,t}$ range from 0 to 1 each. Accordingly, $SMTH_{i,t}$ ranges between 0 and 1. I construct a firm-year measure of observed earnings smoothness.

To test H1, I extend the model from Faulkender and Wang (2006) by introducing the income smoothing measure as an additional explanatory variable and interacting change in cash holdings with the above variables. In my subsequent equation, the abnormal return $r_{i,t} - R_{i,t}^B$ that is attributable to the unexpected change in cash is estimated as the difference between the actual stock return and the benchmark return of

25 size and book-to-market portfolios based on the Fama and French (1993). More specifically, I use the following regression model:

$$\begin{aligned}
r_{i,t} - R_{i,t}^B = & \gamma_0 + \gamma_1 \Delta C_{i,t} + \gamma_2 \Delta E_{i,t} + \gamma_3 \Delta NA_{i,t} + \gamma_4 \Delta RD_{i,t} + \gamma_5 \Delta I_{i,t} + \\
& \gamma_6 \Delta D_{i,t} + \gamma_7 C_{i,t-1} + \gamma_8 L_{i,t} + \gamma_9 NF_{i,t} + \gamma_{10} SMTH_{i,t} + \gamma_{11} C_{i,t-1} \times \Delta C_{i,t} + \\
& \gamma_{12} L_{i,t} \times \Delta C_{i,t} + \gamma_{13} SMTH_{i,t} \times \Delta C_{i,t} + \text{Year Dummies} + \\
& \text{Industry Fixed Effects} + \varepsilon_{i,t}
\end{aligned} \tag{2}$$

The variables are $r_{i,t}$, the stock return during fiscal year t ; $R_{i,t}^B$, benchmark return in year t (Fama-French 25 portfolio return); $C_{i,t}$, the level of cash holdings; $E_{i,t}$, earnings before interest and extraordinary items; $NA_{i,t}$, total assets net of cash at time t ; $RD_{i,t}$, research and development expense at time t ; $I_{i,t}$, interest expense at time t ; $D_{i,t}$, total dividends at time t ; $L_{i,t}$, leverage at the end of fiscal year t ; and $NF_{i,t}$, net financing during the fiscal year t .

The focus of this analysis is on the dollar change in equity value for a one-dollar change in liquid asset holdings ($\Delta C_{i,t}$). Because the stock return is the spread between $MV_{i,t}$ and $MV_{i,t-1}$ deflated by $MV_{i,t-1}$, the normalization by $MV_{i,t-1}$ allows me to interpret the estimated coefficients as the marginal values of the independent variables. In particular, the value of an extra dollar of cash is captured by the coefficient estimates of γ_1 , γ_{11} , γ_{12} , and γ_{13} .

I use COMPUSTAT for accounting variables and CRSP for stock return variables. The sample period is from 1971 to 2010 since I restrict the sample to firms that have information for over five year in a row in COMPUSTAT and CRSP.⁵ Firms in financial and regulated industries are excluded due to the unique nature of their financial statements. The final sample comprises 97,815 firm-year observations. In all subsequent analyses, I winsorize all variables at the 2 percent and 98 percent levels to mitigate the effect of outliers. Table 1 presents descriptive statistics for all variables. In Table 2, I present the Pearson correlation matrix for the variables included in the baseline specification.⁶

[Table 1 here]

[Table 2 here]

IV. Empirical Results

The effect of income smoothing on the relation between change in cash holdings and return

First, I explore whether the marginal value of cash depends on the extent of income smoothing. Table 3 presents the results from the equation (2). The variables of

⁵ Therefore, the results should be interpreted with caution since my sample is not free from the survivorship bias. However, the results are qualitatively similar even if I change the period required to calculate income smoothing measures from five to ten years.

⁶ I do not observe any extreme correlations among the data, which suggests that multicollinearity should not be a concern in my subsequent tests.

interest are the interaction terms of income smoothing and changes in cash balances. Column (1) displays the effect of overall income smoothing on outside investors' valuation of cash resources. The interaction term of cash changes and the income smoothing measure is negatively and significantly related to excess stock return. This finding exhibits that high income smoothing distorts earnings informativeness, thereby deteriorating the value of cash holdings for shareholders.

[Table 3 here]

This effect is also economically significant. For example, an increase in the income smoothing rank from a lower quartile to an upper quartile reduces the marginal value of cash by \$0.225 on average. Specifically, the value of an extra dollar of cash is about \$1.165 ($=\$1.468 - 0.687 \times 0.015 - 0.775 \times 0.232 - 0.451 \times 0.25$) on average where $SMTH_{i,t}$ is in the first quartile, relative to \$0.939 in the third quartile, suggesting that shareholder wealth related to liquid assets declines by 19 percent due to income smoothing. This evidence supports that more income smoothing is likely to show managers' capability to waste, misuse, and even steal liquid assets, thus leading to a large discount on the value of cash reserves. Additionally, I examine the effect of each measure of income smoothing on the association between change in market value and change in cash holdings in column (2) and (3). The results are qualitatively similar with the result with overall smoothing measure.

Controlling for corporate governance

The quality of a firm's corporate governance is strongly related to the marginal value of cash. (Dittmar and Mahrt-Smith 2007; Huang and Zhang 2011). In initial analysis, I have not controlled for governance because requiring data on governance substantially reduce the sample size. However, to ensure that the effect of income smoothing on corporate cash holdings is robust to controlling for the quality of corporate governance, I replicate my analysis using the subsample of firms that have available governance data.

I use the following two corporate governance proxies, which Dittmar and Mahrt-Smith (2007) find to be related to the value of cash holdings: (1) Gompers et al. (2003)'s G-score, and (2) Bebchuk et al. (2009)'s E-score. These scores are reported for 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006 by the Investor Responsibility Research Center (IRRC). Therefore, the sample period is limited to 1990-2006 for the analyses. For years when G-scores and E-scores are not available, I use the scores for the most recent years. From the definition of these scores, higher values of these scores are related to weak corporate governance. Due to data restriction, the number of observations falls substantially. It falls to 11,702. However, the results do not change after I include the governance proxies in my model as in Dittmar and Mahrt-Smith (2007). Table 4 presents the results.

[Table 4 here]

In Panel A of Table 4 reports the estimation using G-scores. In column 1, I confirm that income smoothing is negatively associated with market return regarding cash holdings in spite of small sample size. In column 2, I confirm the result of Dittmar and Mahrt-Smith (2007) that the marginal value of cash holdings is reduced as G-scores increase. I then include both income smoothing and G-scores in the model. The results are reported in Table 6 under column (3). Still, the coefficients (t-values) on the interaction between change in cash balance and income smoothing is -0.360 (1.69) and statistically significant at 10% level.

In Panel B of Table 4 replaces G-Scores with the E-scores and provide similar results; in column (3) the coefficients (t-values) on the interaction between change in cash balance and income smoothing is -0.358(1.68) and statistically significant at 10% level. Therefore, the income smoothing effect is robust to controlling for corporate governance using both G-scores and E-scores.

In Panel C of Table 4, I provide further evidence that agency cost erodes the value of cash holdings held by firms with high income smoothing. I divide my sample into firms with bad corporate governance and firms with good corporate governance. If income smoothing garbles the information in the financial reporting, the effect on value of cash would be severe in firms with bad corporate governance. I estimate Model (2) separately for firms with good and bad corporate governance. As I expected, the negative impact of income smoothing on the value of cash holdings is more severe in firms with bad corporate governance. While the coefficients on the interactions term between change in cash and income smoothing are statistically significant at firms with

high G-scores and E-scores, the coefficients at firms with low G-scores and E-scores are insignificant. The results confirm the H2 that the negative effect of income smoothing can be mitigated by sound corporate governance.

Distinguishing the excess cash holdings

It could be argued that the excess component of the change in cash holdings is more likely to bring the decrease in the value of a change in cash holdings. Therefore, change in excess cash holdings could be a better construct in this research design than change in cash. From this line of reasoning, I examine the effect of income smoothing on the excess cash holdings that is calculated from the optimal level of cash holdings in Opler et al. (1999);

$$C_{i,t} = \beta_0 + \beta_1 MB_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 CFO_{i,t} + \beta_4 Lev_{i,t} + \beta_5 R\&D + \beta_6 DIV_{i,t} + \beta_7 C_{i,t-1} + \beta_8 STD(CFO) + \text{Year Dummies} + \text{Industry Fixed Effects} + \varepsilon_{i,t} \quad (3)$$

where $C_{i,t}$ is cash plus marketable securities at the end of year t scaled by beginning market value of equity; MB is total firm value at the beginning of the year scaled by beginning total assets; $SIZE$ is natural logarithm of total assets; CFO is cash flow from operations in year t scaled by beginning market value of equity; Lev is leverage; $R\&D$ is research and development expenses in year t scaled by sales; DIV is an indicator variable taking the value of 1 if the firm pays dividends during year t and 0

otherwise; $C_{i,t-1}$ is lagged $C_{i,t}$; $STD(OCF)$ is the 5 year of standard deviations of CFO for the firm, Industry fixed effects are defined according to two digit SIC code. I refer to the residual from model (3) as excess cash (EC), which I use in model (2) in lieu of the cash balance. The results, reported in Table 5 under column 1, are qualitatively similar to those reported in Table 4. Specifically, the value of an excess dollar of cash is about \$0.429 ($=\$0.520 - 0.259 \times 0.015 - 0.236 \times 0.232 - 0.127 \times 0.25$) on average where $SMTH_{i,t}$ is in the first quartile, relative to \$0.366 in the third quartile, suggesting that shareholder wealth related to excess cash declines by 15 percent due to income smoothing.

[Table 5 here]

In summary, my findings suggest that, *ceteris paribus*, income smoothing reduces shareholder wealth because the value of liquid assets deteriorates due to income smoothing behaviors. Also, the effects of income smoothing on the value of cash holdings are stronger in the firms with weak corporate governance. The results could imply that income smoothing garbles information in earnings.

V. Conclusion

Despite prior studies examining the informative role of income smoothing, its effects on accounting quality and shareholder wealth is open to debate. In this study, I

find that the contribution of cash assets to shareholder value is reduced as income is smoothed. By doing so, I support the notion that income smoothing garbles information. The results illustrate that outside investors worry about the negative outcomes from managers' discretion on financial reporting, even in an environment with low threat of private benefit extraction such as the U.S.

While I provide compelling evidence that income smoothing destroys shareholder wealth in my specific setting, I cannot perfectly discern the effects of income smoothing. Specifically, it is still an unresolved question as to whether fundamental smoothness improves or worsens the firm's information environment. Even though fundamental income smoothing reduces the marginal value of cash holdings, it is possible that fundamental smoothness benefits debt holders or other stakeholders of the firm if the results stem from the reduced implied option value for equity investors. Also, while this study focuses on the agency motive of corporate cash holdings, operating risk is also an important determinant of the value of cash holdings. Future research should be conducted on this issue.

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Table 1. Descriptive statistics

Variable	N	Mean	Std Dev	25th Pctl	Median	75th Pctl
$r_{i,t} - R_{i,t}^B$	97,815	0.017	0.471	-0.287	-0.065	0.210
$\Delta C_{i,t}$	97,815	0.015	0.129	-0.028	-0.003	0.046
$\Delta E_{i,t}$	97,815	0.018	0.174	-0.028	0.009	0.045
$\Delta NA_{i,t}$	97,815	0.095	0.411	-0.032	0.061	0.215
$\Delta RD_{i,t}$	97,815	0.001	0.014	0.000	0.000	0.001
$\Delta I_{i,t}$	97,815	0.003	0.025	0.000	-0.002	0.007
$\Delta D_{i,t}$	97,815	0.000	0.006	0.000	0.000	1.357
$C_{i,t-1}$	97,815	0.173	0.212	0.037	0.096	0.218
$L_{i,t}$	97,815	0.232	0.174	0.082	0.219	0.350
$NF_{i,t}$	97,815	0.032	0.209	-0.038	0.000	0.067

$r_{i,t} - R_{i,t}^B$ is an excess stock return in fiscal year t ; where $r_{i,t}$ is the annual return at time t , and $R_{i,t}^B$ is Fama and French (1993) size and book-to-market matched portfolio return during fiscal year t . $\Delta C_{i,t}$ is a ratio of change in cash and cash equivalents at time t to lagged market value of equity ($MV_{i,t-1}$). $\Delta E_{i,t}$ is a spread in earnings before interest and extraordinary item divided by $MV_{i,t-1}$. $\Delta NA_{i,t}$ is a change in assets net of cash holdings during the year normalized by $MV_{i,t-1}$. $\Delta RD_{i,t}$ is a change in R&D expenses from fiscal year $t-1$ to t scaled by $MV_{i,t-1}$. $\Delta I_{i,t}$ is a ratio of change in interest expense at time t to $MV_{i,t-1}$. $\Delta D_{i,t}$ is a change in common dividends paid over fiscal year t deflated by $MV_{i,t-1}$. $C_{i,t-1}$ is a level of cash and cash equivalents at time $t-1$ normalized by $MV_{i,t-1}$. $L_{i,t}$ is total debts scaled by the sum of total debt and market value of equity. $NF_{i,t}$ is total issuance of debt and equity net of equity repurchases and debt redemption deflated by $MV_{i,t-1}$

Table 2. Pearson correlation matrix

	$r_{i,t} - R_{i,t}^E$	$\Delta C_{i,t}$	SMTH $_{i,t}$	SMTH1 $_{i,t}$	SMTH2 $_{i,t}$	$\Delta E_{i,t}$	$\Delta NA_{i,t}$	$\Delta RD_{i,t}$	$\Delta I_{i,t}$	$\Delta D_{i,t}$	$C_{i,t-1}$	$L_{i,t}$
$\Delta C_{i,t}$	0.213											
SMTH $_{i,t}$	0.021	0.023										
SMTH1 $_{i,t}$	0.024	0.023	0.979									
SMTH2 $_{i,t}$	0.017	0.017	0.979	0.919								
$\Delta E_{i,t}$	0.307	0.151	-0.011	-0.010	-0.011							
$\Delta NA_{i,t}$	0.165	-0.060	0.147	0.148	0.141	0.080						
$\Delta RD_{i,t}$	0.040	0.021	0.044	0.043	0.044	-0.115	0.145					
$\Delta I_{i,t}$	-0.063	-0.014	0.066	0.067	0.063	-0.149	0.396	0.053				
$\Delta D_{i,t}$	0.100	0.027	0.107	0.109	0.101	0.054	0.158	0.038	0.003			
$C_{i,t-1}$	0.118	-0.166	-0.021	-0.014	-0.026	0.104	-0.020	-0.064	-0.040	-0.008		
$L_{i,t}$	-0.077	-0.032	0.075	0.067	0.079	-0.036	0.096	-0.022	0.220	-0.064	-0.059	
NF $_{i,t}$	0.049	0.175	0.024	0.025	0.022	-0.060	0.485	0.052	0.356	0.031	-0.076	0.156

SMTH $_{i,t}$ is a composite measure of overall earnings smoothness, calculated as the average percentile ranking of SMTH1 $_{i,t}$ and SMTH2 $_{i,t}$. SMTH1 $_{i,t}$ is Standard deviation of net income before extraordinary items scaled by lagged total assets divided by the standard deviation of operating cash flow over the five year horizon ending in year t multiplied by -1. SMTH2 $_{i,t}$ is a Correlation between operating cash flow and accruals multiplied by -1, where the correlation is computed over five year horizon ending in year t . Definitions of other variables are shown at Table 1.

Table 3. The effect of income smoothing on the association between change in market value and change in cash holdings

Variable	Model 1	Model 2	Model 3
Intercept	-0.174*** (10.05)	-0.174*** (10.08)	-0.172*** (9.99)
$\Delta C_{i,t}$	1.468*** (36.00)	1.453*** (35.88)	1.466*** (36.31)
$\Delta E_{i,t}$	0.620*** (49.77)	0.621*** (49.81)	0.619*** (49.72)
$\Delta NA_{i,t}$	0.242*** (41.05)	0.242*** (41.02)	0.243*** (41.16)
$\Delta RD_{i,t}$	1.522*** (12.43)	1.525*** (12.45)	1.521*** (12.42)
$\Delta I_{i,t}$	-1.330*** (16.36)	-1.332*** (16.38)	-1.328*** (16.34)
$\Delta D_{i,t}$	3.812*** (19.46)	3.803*** (19.42)	3.822*** (19.51)
$C_{i,t-1}$	0.280*** (30.94)	0.279*** (30.89)	0.280*** (30.98)
$L_{i,t}$	-0.100*** (11.36)	-0.099*** (11.32)	-0.100*** (11.37)
$NF_{i,t}$	-0.088*** (8.29)	-0.088*** (8.25)	-0.089*** (8.31)
$SMTH_{i,t}$	0.022*** (4.41)		
$SMTH1_{i,t}$		0.023*** (4.77)	
$SMTH2_{i,t}$			0.019*** (3.84)
$C_{i,t-1} \times \Delta C_{i,t}$	-0.687*** (14.29)	-0.685*** (14.24)	-0.688*** (14.32)
$L_{i,t} \times \Delta C_{i,t}$	-0.775*** (9.96)	-0.783*** (10.05)	-0.772*** (9.92)
$SMTH_{i,t} \times \Delta C_{i,t}$	-0.451*** (9.31)		
$SMTH1_{i,t} \times \Delta C_{i,t}$		-0.419*** (8.82)	
$SMTH2_{i,t} \times \Delta C_{i,t}$			-0.449*** (-9.42)
N	97,815	97,815	97,815
R ²	0.2008	0.2006	0.2008

I extend the model from Faulkender and Wang (2006) by introducing the income smoothing measure as an additional explanatory variable and interacting change in cash holdings with the above variables. More specifically, I use the following regression model:

$$r_{i,t} - R_{i,t}^B = \gamma_0 + \gamma_1 \Delta C_{i,t} + \gamma_2 \Delta E_{i,t} + \gamma_3 \Delta NA_{i,t} + \gamma_4 \Delta RD_{i,t} + \gamma_5 \Delta I_{i,t} + \gamma_6 \Delta D_{i,t} + \gamma_7 C_{i,t-1} + \gamma_8 L_{i,t} \\ + \gamma_9 NF_{i,t} + \gamma_{10} SMTH_{i,t} + \gamma_{11} C_{i,t-1} \times \Delta C_{i,t} + \gamma_{12} L_{i,t} \times \Delta C_{i,t} + \gamma_{13} SMTH_{i,t} \times \Delta C_{i,t} \\ + \text{Year Dummies} + \text{Industry Fixed Effects} + \varepsilon_{i,t}$$

$r_{i,t} - R_{i,t}^B$ is an excess stock return in fiscal year t ; where $r_{i,t}$ is the annual return at time t , and $R_{i,t}^B$ is Fama and French (1993) size and book-to-market matched portfolio return during fiscal year t . $\Delta C_{i,t}$ is a ratio of change in cash and cash equivalents at time t to lagged market value of equity ($MV_{i,t-1}$). $SMTH_{i,t}$ is a composite measure of overall earnings smoothness, calculated as the average percentile ranking of $SMTH1_{i,t}$ and $SMTH2_{i,t}$. $SMTH1_{i,t}$ is Standard deviation of net income before extraordinary items scaled by lagged total assets divided by the standard deviation of operating cash flow over the five year horizon ending in year t multiplied by -1. $SMTH2_{i,t}$ is a Correlation between operating cash flow and accruals multiplied by -1, where the correlation is computed over five year horizon ending in year t . $\Delta E_{i,t}$ is a spread in earnings before interest and extraordinary item divided by $MV_{i,t-1}$. $\Delta NA_{i,t}$ is a change in assets net of cash holdings during the year normalized by $MV_{i,t-1}$. $\Delta RD_{i,t}$ is a change in R&D expenses from fiscal year $t-1$ to t scaled by $MV_{i,t-1}$. $\Delta I_{i,t}$ is a ratio of change in interest expense at time t to $MV_{i,t-1}$. $\Delta D_{i,t}$ is a change in common dividends paid over fiscal year t deflated by $MV_{i,t-1}$. $C_{i,t-1}$ is a level of cash and cash equivalents at time $t-1$ normalized by $MV_{i,t-1}$. $L_{i,t}$ is total debts scaled by the sum of total debt and market value of equity. $NF_{i,t}$ is total issuance of debt and equity net of equity repurchases and debt redemption deflated by $MV_{i,t-1}$.

*, **, *** Denote two-tailed significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

The numbers in parentheses are t-values. All regressions include year and industry indicators (not shown).

The dependent variable is $r_{i,t} - R_{i,t}^B$.

Table 4. The effect of income smoothing on the association between change in market value and change in cash holdings after controlling corporate governance

Panel A. G-Score

Variable	Model 1	Model 2	Model 3
Intercept	-0.100*** (3.88)	-0.093*** (3.18)	-0.119*** (4.32)
$\Delta C_{i,t}$	1.664*** (10.55)	1.973*** (7.90)	2.124*** (7.91)
$\Delta E_{i,t}$	0.700*** (15.41)	0.701*** (15.42)	0.700*** (15.35)
$\Delta NA_{i,t}$	0.248*** (10.98)	0.253*** (11.24)	0.246*** (10.92)
$\Delta RD_{i,t}$	1.101*** (2.69)	1.110*** (2.71)	1.111*** (2.72)
$\Delta I_{i,t}$	-2.705*** (6.15)	-2.739*** (6.24)	-2.719*** (6.19)
$\Delta D_{i,t}$	3.223*** (4.41)	3.301*** (4.56)	3.232*** (4.43)
$C_{i,t-1}$	0.410*** (11.56)	0.411*** (11.77)	0.415*** (11.74)
$L_{i,t}$	-0.070*** (2.90)	-0.070*** (2.88)	-0.073*** (3.02)
$NF_{i,t}$	-0.266*** (6.08)	-0.271*** (6.21)	-0.265*** (6.08)
$SMTH_{i,t}$	0.046*** (4.07)		0.046*** (4.03)
G Score _{i,t}		0.002* (1.89)	0.001* (1.76)
$C_{i,t-1} \times \Delta C_{i,t}$	-0.735*** (3.06)	-0.761*** (3.15)	-0.805*** (3.02)
$L_{i,t} \times \Delta C_{i,t}$	-0.831** (2.32)	-0.822** (2.31)	-0.785** (2.19)
SM TH_{i,t} $\times \Delta C_{i,t}$	-0.378* (1.75)		-0.360* (1.69)
G Score_{i,t} $\times \Delta C_{i,t}$		-0.051** (2.31)	-0.050** (2.28)
N	11,702	11,702	11,702
R ²	0.1724	0.1720	0.1720

Panel B. E-Score

Variable	Model 1	Model 2	Model 3
Intercept	-0.100*** (3.88)	-0.084*** (3.02)	-0.111*** (4.22)
$\Delta C_{i,t}$	1.664*** (10.55)	1.830*** (10.36)	1.982*** (9.79)
$\Delta E_{i,t}$	0.700*** (15.41)	0.700*** (15.40)	0.699*** (15.33)
$\Delta NA_{i,t}$	0.248*** (10.98)	0.252*** (11.26)	0.246*** (10.94)
$\Delta RD_{i,t}$	1.101*** (2.69)	1.094*** (2.67)	1.094*** (2.68)
$\Delta I_{i,t}$	-2.705*** (6.15)	-2.743*** (6.26)	-2.721*** (6.22)
$\Delta D_{i,t}$	3.223*** (4.41)	3.338*** (4.61)	3.268*** (4.48)
$C_{i,t-1}$	0.410*** (11.56)	0.412*** (11.75)	0.417*** (11.72)
$L_{i,t}$	-0.070*** (2.90)	-0.068*** (2.83)	-0.072*** (2.98)
$NF_{i,t}$	-0.266*** (6.08)	-0.270*** (6.20)	-0.265*** (6.07)
$SMTH_{i,t}$	0.046*** (4.07)		0.046*** (4.04)
E Score _{i,t}		0.004* (1.84)	0.004* (1.78)
$C_{i,t-1} \times \Delta C_{i,t}$	-0.735*** (3.06)	-0.745*** (3.11)	-0.789*** (3.27)
$L_{i,t} \times \Delta C_{i,t}$	-0.831** (2.32)	-0.832** (2.37)	-0.795** (2.25)
$SMTH_{i,t} \times \Delta C_{i,t}$	-0.378* (1.75)		-0.358* (1.68)
E Score_{i,t} $\times \Delta C_{i,t}$		-0.138*** (2.90)	-0.136*** (2.84)
N	11,702	11,702	11,702
R ²	0.1724	0.1725	0.1738

Panel C. Divide sample into firms with weak and strong governance

Variable	G Score high	G Score low	E Score high	E Score low
Intercept	-0.087*** (4.91)	-0.122** (2.41)	-0.086*** (4.49)	-0.124*** (2.66)
$\Delta C_{i,t}$	1.911*** (7.83)	1.550*** (7.66)	1.691*** (7.25)	1.635*** (7.83)
$\Delta E_{i,t}$	0.633*** (9.23)	0.746*** (12.58)	0.676*** (10.33)	0.718*** (11.13)
$\Delta NA_{i,t}$	0.235*** (7.83)	0.258*** (7.93)	0.201*** (6.71)	0.292*** (8.56)
$\Delta RD_{i,t}$	0.892 (1.55)	1.303** (2.31)	0.744 (1.38)	1.349** (2.28)
$\Delta I_{i,t}$	-2.325*** (3.71)	-3.060*** (5.02)	-1.864*** (2.95)	-3.529*** (5.92)
$\Delta D_{i,t}$	4.362*** (4.31)	2.260** (2.14)	4.073*** (3.80)	2.419** (2.40)
$C_{i,t-1}$	0.467*** (8.41)	0.395*** (8.61)	0.465*** (9.47)	0.402*** (8.39)
$L_{i,t}$	-0.045 (1.33)	-0.078** (2.28)	-0.084** (2.39)	-0.073** (2.15)
$NF_{i,t}$	-0.349*** (5.76)	-0.194*** (3.10)	-0.271*** (4.44)	-0.259*** (4.09)
$SMTH_{i,t}$	0.045*** (3.11)	0.046*** (2.73)	0.055*** (3.68)	0.039** (2.34)
$C_{i,t-1} \times \Delta C_{i,t}$	-0.783* (1.79)	-0.826*** (2.88)	-0.831** (2.19)	-0.755** (2.54)
$L_{i,t} \times \Delta C_{i,t}$	1.244** (2.17)	0.560 (1.25)	-0.966* (1.86)	-0.687 (1.46)
$SMTH_{i,t} \times \Delta C_{i,t}$	-0.819*** (2.69)	-0.082 (-0.28)	-0.662** (2.19)	-0.068 (0.23)
N	5,631	6,071	5,778	5,924
R ²	0.1804	0.1797	0.1801	0.1827

G-Score is governance index from Gompers, Ishii, and Metrick (2003). E-Score is governance index from Bebchuk, Cohen, and Ferrell (2009). Larger value of G-Score and E-Score means weaker corporate governance. Definitions of other variables are shown at Table 3.

Table 5. The effect of income smoothing on the association between change in market value and change in excess cash holdings

Variable	Model 1	Model 2	Model 3
Intercept	-0.138*** (8.24)	-0.138*** (8.28)	-0.136*** (8.17)
$\Delta EC_{i,t}$	0.520*** (24.55)	0.518*** (24.58)	0.517*** (24.60)
$\Delta E_{i,t}$	0.672*** (51.14)	0.673*** (51.16)	0.672*** (51.10)
$\Delta NA_{i,t}$	0.224*** (36.94)	0.223*** (36.90)	0.224*** (37.02)
$\Delta RD_{i,t}$	1.795*** (13.82)	1.794*** (13.81)	1.796*** (13.83)
$\Delta I_{i,t}$	-1.409*** (16.60)	-1.410*** (16.61)	-1.409*** (16.59)
$\Delta D_{i,t}$	4.479*** (22.30)	4.472*** (22.27)	4.489*** (22.35)
$C_{i,t-1}$	0.258*** (27.41)	0.258*** (27.40)	0.258*** (27.42)
$L_{i,t}$	-0.134*** (14.38)	-0.133*** (14.34)	-0.134*** (14.40)
$NF_{i,t}$	-0.043*** (3.92)	-0.043*** (3.91)	-0.043*** (3.94)
$SMTH_{i,t}$	0.022*** (4.26)		
$SMTH1_{i,t}$		0.023*** (4.62)	
$SMTH2_{i,t}$			0.019*** (3.69)
$C_{i,t-1} \times \Delta C_{i,t}$	-0.259*** (11.40)	-0.260*** (11.40)	-0.260*** (11.45)
$L_{i,t} \times \Delta C_{i,t}$	-0.236*** (5.96)	-0.236*** (5.99)	-0.236*** (5.96)
$SMTH_{i,t} \times \Delta EC_{i,t}$	-0.127*** (4.94)		
$SMTH1_{i,t} \times \Delta EC_{i,t}$		-0.122*** (4.86)	
$SMTH2_{i,t} \times \Delta EC_{i,t}$			-0.122*** (-4.82)
N	90,328	90,328	90,328
R ²	0.1805	0.1805	0.1805

I extend my analysis by examining the effect of income smoothing on the excess cash holdings that is calculated from the optimal level of cash holdings in Opler et al. (1999);

$$C_{i,t} = \beta_0 + \beta_1 MB_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 CFO_{i,t} + \beta_4 Lev_{i,t} + \beta_5 R\&D + \beta_6 DIV_{i,t} + \beta_7 C_{i,t-1} + \beta_8 STD(CFO) + \text{Year Dummies} + \text{Industry Fixed Effects} + \varepsilon_{i,t} \quad (3)$$

where $C_{i,t}$ is cash plus marketable securities at the end of year t scaled by beginning market value of equity; MB is total firm value at the beginning of the year scaled by beginning total assets; $SIZE$ is natural logarithm of total assets; CFO is cash flow from operations in year t scaled by beginning market value of equity; Lev is leverage; $R\&D$ is research and development expenses in year t scaled by sales; DIV is an indicator variable taking the value of 1 if the firm pays dividends during year t and 0 otherwise; $C_{i,t-1}$ is lagged $C_{i,t}$; $STD(OCF)$ is the 5 year of standard deviations of CFO for the firm, Industry fixed effects are defined according to two digit SIC code. I refer to the residual from model (3) as excess cash (EC), which I use in model (2) in lieu of the cash balance. Definitions of other variables are shown at Table 3.

국문 초록

이 논문에서는 이익유연화가 기업이 보유하는 현금의 시장 가치에 미치는 효과에 대해 관찰하였다. 분석 결과에 따르면, 이익유연화는 기업이 보유하고 있는 현금의 주주 가치에 부정적인 영향을 미치고 있음을 확인하였다. 또한, 현금의 가치에 대한 이익유연화의 부정적인 효과는 기업지배구조가 약한 기업들에게 더욱 두드러지게 나타나고 있음을 확인할 수 있었다. 이러한 결과는, 이익유연화로 인해 회계 이익이 전달하는 정보가 왜곡되고, 이로 인해 야기되는 정보불균형이 기업이 보유하고 있는 유동 자산의 가치를 할인하는 것이라고 해석될 수 있다. 이러한 결과는 현금을 다르게 정의하거나 기업지배구조를 통제 한 이후에도 일관되게 유지되었다.

주요어 : 이익유연화, 현금, 정보불균형, 기업지배구조

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