Assessing the Impact of Information Risk on Cost of Capital Using the Fair Value Disclosure
-Based on the Level Hierarchy Infomation from Supplementary Schedules-

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Abstract

This paper investigates whether information risk measured by fair value hierarchy information affects a firm's cost of capital. With a sample of 200 KOSPI firms of 2011 and 2012, we assume that information risk at levels 2 and 3 is higher than that at level 1 and examine whether information risk is positively related to the implied cost of equity.

The results are consistent with our expectations. First, our results are similar to those of Riedl and Serafeim (2011) in that levels 2 and 3, containing more information uncertainty, require higher cost of capital. Second, a firm's ethical behavior is likely to affect the information risk caused by the firm's information uncertainty, which may arise during the production of fair value hierarchy information. We argue that a firm's ethical behavior could be one determinant in reducing firm's cost of capital, conditionally. This indicates that considering the firm's ethical attributes is an important issue when the firm establishes its disclosure policies. In conclusion, we contend that information risk measured by fair value hierarchy information affects a firm's cost of capital and that this is also affected by the firm's ethical behavior, such as corporate social responsibility (CSR) activities.

These results necessitate a consistent fair value evaluation system to deal with the information uncertainty generated during the production of fair value hierarchy information such as improved fair value measurement and reinforcement of a monitoring system for fair value valuation.

1. Introduction

FASB of the U.S. announced the Fair Value Measurement Disclosure (SFAS 157) in 2006. SFAS No. 157 suggests the basic framework for fair value measurement and provides more detailed disclosure requirements. More precisely, SFAS No. 157 requires the disclosure of fair value hierarchy information on fair value asset and liability according to levels 1, 2 and 3. In 2011, IASB pronounced IFRS No. 13 in order to provide a basic framework, similar with SFAS No. 157. In Korea, the fair value hierarchy disclosure has been required for listed companies after the adoption of IFRS No. 13.

The adoption of SFAS No. 157 or IFRS No. 13 has encouraged researchers to study the usefulness of each level of the hierarchy information. The previous studies were generally focused on the fair value relevance and reliability. While some hold the view that fair value usefulness shows strong fair value relevance and better represents economical substance than historical measurement, others contend that fair value measurement enhances the likelihood of error in the estimation due to the managers' discretionary authority and, therefore, decreases the reliability of accounting information (Landsman, 2007; Penman, 2007).

This paper studies the relation between cost of capital and information risk from fair value hierarchy as we expect the reliability and uncertainty of fair value measurement to increase due to possible errors in the estimation during the production of fair value information. Prior studies have tested the usefulness of fair value information provided by the companies and further investigated whether this information is reliable. A majority suggest that problems occur in terms of reliability of the fair value hierarchy information when managers engage in opportunistic behaviors during the production of fair value information [(1)]. Aboody et al. (2006) and Bartov et al. (2007) report the firms' opportunistic behavior when they manipulate the input for each model for fair value level evaluation. Song et al. (2011) argue that the value relevance of fair value hierarchy level information is discriminative. They report that levels 2 and 3 have less value relevance than level 1 through the level hierarchy level information of the financial firms, because levels 2 and 3 tend to have more information asymmetry than level 1 has. Furthermore, Riedl and Serafeim (2011) expect that the information risk of the level hierarchy is relative to each level. They also report that each level shows a coefficient of a different value represented by beta as a proxy for the firm's financial risk. They argue that levels 2 and 3 show higher information risk than level 1 since levels 2 and 3 have potentially more information asymmetry than level 1. They report that levels 2 and 3 have bigger positive coefficient than level 1. Based on these findings of the previous studies, we examine the relation between information risk from fair value hierarchy disclosure and

cost of capital by using the implied cost of equity capital(2). Our level hierarchy data is collected from the Data Analysis, Retrieval and Transfer System (DART) reported in 2011 and 2012(3).

Our contribution is as follows. First, we look at the firm's information risk derived from the level hierarchy information and examine whether the level hierarchy information can be used as a determinant of firm's cost of capital. While Riedl and Sarafeim (2011) use the absolute value of each level hierarchy to verify its relevance to financial risk, we use a new information risk measure based on the information uncertainty of levels 2 and 3. We expect levels 2 and 3 to contain higher information risk than level 1 based on the findings of Kolev (2009), Goh et al. (2009) and Song et al. (2010) that the information uncertainty of levels 2 and 3 is higher than that of level 1. Thus, we develop an information risk measure, ((Levels 2+3)/ (Level total)) (4). The result reveals that the measured information risk from the level hierarchy information is positive with AVG (average of implied cost of equity estimated by the GM, PEG and MPEG models) as a proxy of firm's cost of capital. This supports the arguments made in the studies that information risk affects the cost of capital (Easley and O'Hara, 2004; Lambert et al., 2007; Riedl and Serafeim, 2011).

Second, we test how the firm's ethical level affects the relation between information risk and cost of capital. Kim et al. (2012) report that firm's ethical behavior (corporate and social responsibility (CSR) activity) mitigates information asymmetry (5). They report that firm's earnings management and CSR activity are negatively related; the firm's ethical behavior mitigates managers' opportunistic behavior through firm's private information. CSR activities represent the firm's ethics level and suggest that firms with frequent CSR activities lead to less earnings management. This indicates that if the managers focus on ethical practices outside the firm, the pursuit of self-interest through earnings management decreases voluntarily. Lim et al. (2013) assume that the firm's intrinsic ethical behavior can be reflected in firm's earning management and examine the relation between a firm's earnings management and CSR activity as the firm's external ethical behavior. They suggest that the firm's intrinsic and external ethical behaviors reflect each other; they view that this mutuality between internal and external ethics of the firm affects the managers' opportunistic behavior perverting the firm's value and deceiving the stakeholders. Kim et al. (2011) report that the firm's ethical behaviors such as enhancing labor-management relations, environmental policy and production strategy play a role in decreasing the firm's cost of capital. Furthermore, Kim et al. (2011) suggest that sin firms, expected to show a low ethics level, generally have a relatively higher cost of capital than others(6). This is evident from the fact that market participants carefully base their investment decision on the firm's

ethical behavior since they believe the firm's ethics is related to social norms, regulations and litigation risks. Based on these findings, we assume that the firm's ethical behavior affects the relation between information risk and cost of capital and show that the firm's ethical behavior mitigates the effect of information risk and consequently diminishes the cost of capital.

The remainder of the paper is organized as follows. Section 2 describes the accounting policy for fair value disclosure. Section 3 discusses the previous studies and the development of our hypotheses. Sections 4 and 5 describe the research design and empirical analyses. Section 6 presents the results of sensitivity analyses. Finally, section 7 offers the study conclusions.

2. Background

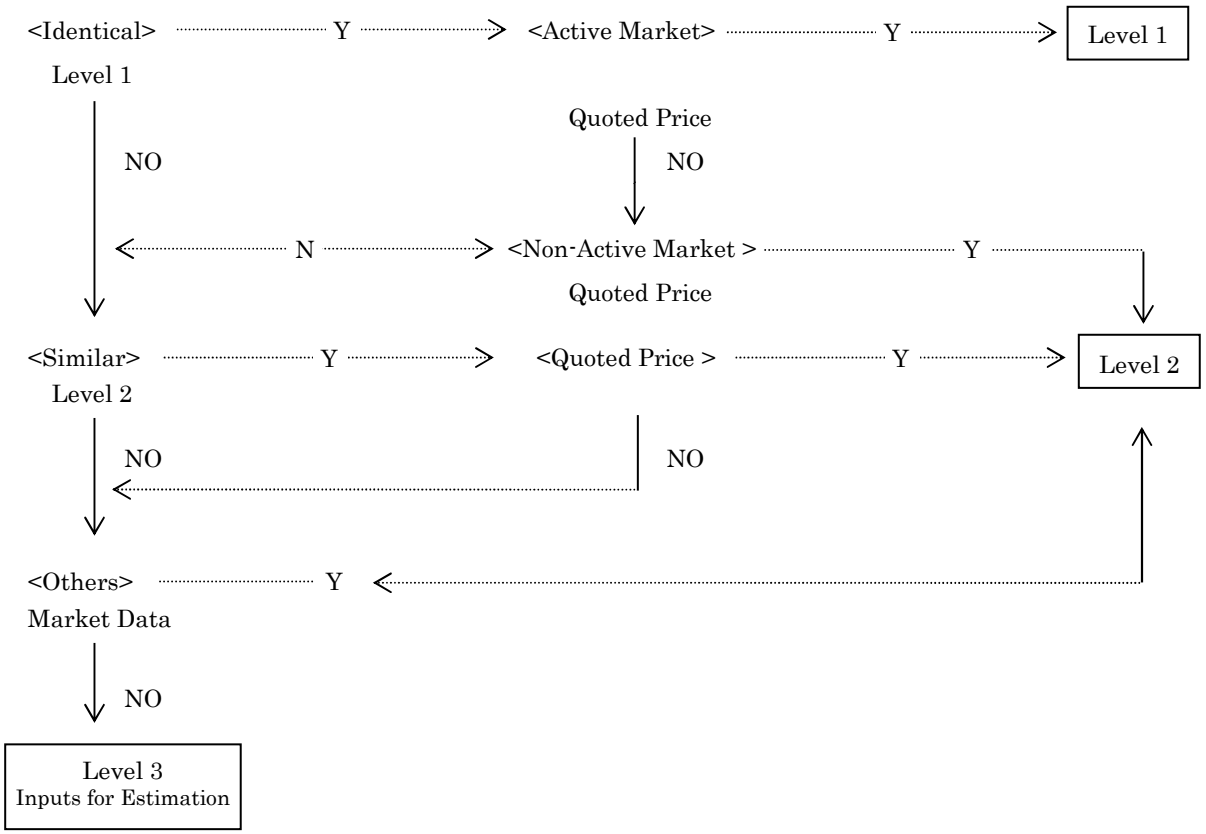
2.1 Fair Value Disclosure

2.1.1 SFAS No.157 (US)

Fair value accounting has been improved continuously in the U.S. In particular, the U.S. announced the adoption of SFAS No. 157 to establish a basic frame for fair value disclosure in 2007, which includes basic requirements for firms in order to measure fair value. They define the basic concept of the fair value as follows. "Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date"

Based on this definition of the fair value, SFAS No. 157 requires a level hierarchy disclosure (levels 1, 2 and 3) according to the level of the active market. Level 1 includes assets and liabilities traded in active markets. These assets and liabilities are considered to show reliable estimated prices. Level 2 discloses assets and liabilities whose prices are observable, either directly or indirectly, but not in active markets. On the other hand, level 3 lists non-trading assets and liabilities in a market whose prices are estimated by the firm. In particular, fair value disclosure requires that when the firm estimates prices of non-trading assets and liabilities, it adopts the internal market price model to disclose for level 3. Accordingly, SFAS No. 157 requires additional information in terms of estimation procedure for level 3 assets and liabilities.

<Figure 1>
The Application of the Fair Value Hierarchy Information (7)



2.1.2 IFRS 13 (IFRS)

The International Accounting Standard Board (IASB) announced IFRS No. 13 to provide a basic framework for fair value measurement in 2011 and adopted it in 2014. IFRS No. 13 is the outcome of the consolidation between IASB and FASB standards. IFRS No. 13 is similar with the disclosure of SFAS No. 157 in that it also requires market-based fair value hierarchy disclosure, not the entity specific measurement. This fair value hierarchy disclosure is used to enhance consistency and comparability of fair value disclosure. IFRS No. 13 also requires the disclosure according to the hierarchy of levels 1, 2 and 3, which also depends on the method of fair value measurement. Level 1 includes the assets and liabilities if they are traded in markets actively. Level 2 includes non-trading assets and liabilities whose prices are still observable from similar assets or liabilities. Level 3 discloses assets and liabilities whose prices are unobservable or derived in the other way. In this case, prices are subjectively evaluated by the firm employing their own method or interpretation.

Korea has adopted IFRS (K-IFRS) for listing firms since 2011. The major change in the accounting environment since the adoption of the IFRS is that Korea's accounting practice has become more principle-based, adopted consolidated financial statements as a main financial statement and tightened the disclosure requirements. IFRS has comprehensively included the fair value accounting of the U.S. GAAP. Accordingly, K-IFRS has also required the fair value hierarchy disclosure (levels 1, 2 and 3) since 2011 in financial statements.

2.2 Prior Literature and Hypothesis Development

Prior studies report that fair value asset and liability information of financial firms has value relevance with market (Barth et al., 1994, 1996; Eccher et al., 1996; Nelson, 1996). Especially, Barth (1994) argues that the fair value of investment security has incremental value relevance with stock price. Barth et al. (1996) also report that the fair value of loans, investment securities and long term debts has value relevance with stock price. On the other hand, Nelson (1996) and Eccher et al. (1996) report that only investment security has value relevance among financial assets and liabilities such as loans, deposits, long term debt.

In Korea, Kim and Kim (2000) and Kim et al. (2002) examine the value relevance of fair value of stock securities and suggest that most stock securities' fair value is linked to stock price. More specifically, Kim and Kim (2000) test the value relevance of the fair value of assets and liabilities held by financial firms. Based on the fair value disclosure in the period between 1993 and 1997, they find that the fair value information (unrealized gain and loss in the evaluation of security) has value relevance with the firms' stock prices. In addition, Yoon et al. (2007) attest that incremental value relevance exists between the fair value of gains and losses obtained through the equity method and the firms' stock price.

Recently, Kolev (2009), Goh et al. (2009) and Song et al. (2010) test the value relevance of the disclosed fair value hierarchy information following SFAS No. 157 in the U.S. Their results show that each of level information has the value relevance; levels 2 and 3 have relatively lower value relevance than level 1 has. This reflects the likelihood of managers and accountants' executing their discretionary authority, which produces error in the estimation when disclosing levels 2 and 3 information.

Botosan (1997), Francis et al. (2004), Easley and O'Hara (2004) and Diamond and Verrecchia (1991) argue that cost of capital for the firm affects its information asymmetry level or accounting qualities. In particular, Easley and O'Hara (2004) report that market participants ask for higher cost of capital for the firm that maintains more private information. Lambert et al. (2007) suggest a theoretical basis as to how disclosure quality affects the firm's cost of capital. Francis et al. (2004) use the accounting quality attributes [8] as

information risk proxies and hypothesize that the higher the value of the proxies, the higher information risk. They conclude that higher information risk is associated with the firm's higher cost of capital.

Based on the prior results, specifically from Riedl and Serafeim (2011) and Song et al. (2010), we assume that levels 2 and 3 have higher information risk than level 1 from the level hierarchy disclosure and test the relation between information risk measured by fair value level hierarchy and cost of capital. First, we expect that information risk is positively related to the implied cost of equity capital. We suggest our first hypothesis as follows.

H1: Ceteris paribus, information risk measured by the fair value hierarchy information is positively related to the firm's implied cost of equity capital.

Dhaliwal et al. (2011) report that frequent CSR activities help reduce the firm's information asymmetry. Firms with frequent CSR activities provide a voluntary disclosure and reliable accounting information to reduce information asymmetry in order to enhance their public image. Kim et al. (2012) assume that CSR activities represent the firm's ethics level and suggest firms with frequent CSR activities lead to less earnings management. This indicates that if the manager focus on ethical practices outside the firm, the pursuit of self interest through earnings management decreases voluntarily. Lim et al. (2013) assume that a firm's CSR activities represent the firm's ethical level; they find that both behaviors are consistently linked. Kim et al. (2011) expects that sin companies, assumed to have low ethical level, are likely to face higher cost of capital than other companies. This indicates that market participants carefully consider the firm's ethical level to base their investment decisions on since the firm's ethical level is linked to social norms, regulations and litigation risks. This leads us to expect that the firm's ethical level and pursuit of ethical behavior are likely to affect the firm's information asymmetry and that the firm's ethical level (CSR activities) is related to the implied cost of equity capital. Finally, we suggest the second main hypothesis as follows.

H2: Ceteris paribus, a firm's frequent ethical practice[9](CSR activities) mitigates the effect of information risk on the implied cost of equity capital.

3. Research Design

3.1 Definition of Main Variables and Measurement

3.1.1 Implied Cost of Equity Capital from Analyst Forecast

The capital asset pricing model (CAPM) is widely known as the most popular method to estimate the firm's cost of capital. However, prior studies argue that the required return by estimating the market beta is incomplete (Elton, 1999). In particular, Fama and French (1997) and Elton (1997) criticize how the historically realized return is able to

measure future expected return. To estimate the cost of capital, it should be applied future expected return, thus the forecast information from market analysts can be a better alternative measure than the historical realized return. In order to estimate the firm's implied cost of capital, we suggest the Gode-Mohanram (GM) model, which adopts current stock price and future EPS estimation by market analysts to measure future expected return (Gode and Mohanram, 2003), and the price-earnings growth (PEG) and modified PEG (MPEG) models, both of which adopt the future expected dividend from the Ohlson-Juettner (OJ) model (Easton, 2004).

1) GM Model

First, we use the GM model developed in Gode and Mohanram (2003) to estimate the implied cost of capital. When we measure the constant growth rate for the GM model, we subtract 3% from the risk-free rate because we attempt to reflect the change of inflation in each period due to the time difference among the estimations of cost of equity capital. The risk-free rate generally uses the Treasury bond return of 3 years, and the payout ratio (dividend per share (DPS)) is restricted between 0 and 1. The consensus data [10] by analysts is constructed by estimating the earnings per share (EPS) data for the following two consecutive periods from FNguide Pro. Constant growth rate adopts the value of the Treasury bond rate subtracted by 3%.[11] The first model to estimate the implied cost of capital is represented as formula (1) below.

$$r_{gm} = A + \sqrt{A^2 + \left(\frac{FEPS_{t+1}}{P_t}\right)(g_2 - (r_f - 0.03))}\ [12] \qquad (1)$$

r_{gm} : Implied cost of equity capital estimated by the GM model

r_f : Risk free rate (3-year Treasury Bond rate)

$FEPS_{t+1}$: Forecasted EPS at time t+1 provided by FNguide Pro

P_t : Stock price at time t

A : $(1/2(r_f\text{-}0.03)+DPS_{t+1}/P_t)$

DPS_{t+1} : Forecasted DPS (future dividend) at time t+1 provided by FNguide Pro

g_2 : Short-term growth rate $((FEPS_{t+2}\text{-}FEPS_{t+1})/FEPS_{t+1})$

2) PEG Model

The second model used to estimate the firm's implied cost of equity capital is the PEG model (Easton, 2004). In this model, future payout ratio (DPS_{t+1}) is regarded as 0. This model can be applied when the EPS forecast consensus at t+1 and t+2 is available. It is based on the MPEG model, but the PEG model ignores the dividend effect on the stock return growth rate. This model only regards the analyst's EPS forecast and current stock price without considering ex-post profit. The PEG model to estimate the implied cost of equity capital is

represented as firm's cost of capital.

$$r_{peg} = \sqrt{(FEPS_{t+2} - FEPS_{t+1})/P_t}\ ^{(13)} \qquad (2)$$

r_{peg}: Implied cost of equity capital estimated by the PEG model

$PEPS_{t+2}$: Forecasted EPS at time t+2 provided by FNguide Pro

3) MPEG Model

The last model used to estimate the implied cost of equity capital is the MPEG model from Easton (2004).[14] It adopts the analyst EPS and DPS forecast at t+1 and t+2 and applies the formula (3) as follows. While the PEG model does not regard ex-post profit, the MPEG model takes ex-post profit (DPS) in account in order to derive the firm's cost of capital.

$$r_{mpeg} = \left(DPS_{t+1} + \sqrt{DPS_{t+1}^2 + 4 * P_t * (FEPS_{t+2} - FEPS_{t+1})}\right) / 2P_t \qquad (3)$$

r_{mpeg} : Implied cost of equity capital estimated by MPEG model

DPS_{t+1} : Forecasted DPS (future dividend) at time t+1 provided by FNguide Pro

3.1.2 Information Risk from Fair Value Hierarchy

This paper tests the relation between information risk and cost of capital, and thus we use the fair value hierarchy information to derive the information risk. Song et al. (2010) and Riedl and Serafeim (2011) argue that levels 2 and 3 show higher level of information uncertainty than level 1 does. Especially, Riedl and Serafeim (2011) show that since the information uncertainty of levels 2 and 3 is higher than that of level 1, they are related to a higher cost of equity capital (equity beta) than level 1 is. While Riedl and Serafeim (2011) [15] use the absolute value of each level, we adopt the ratio of the sum of the two levels to that of all the levels, representing information risk by fair value hierarchy information. Since we assume that levels 2 and 3 contain more information uncertainty, we derive a proxy for information risk as follows.

$$InRisk_{it} = (Level2_{it}+Level3_{it}) / (Level1_{it}+Level2_{it}+Level3_{it}) \qquad (4)$$

3.1.3 Research Model

This paper uses the AVG [16] as the implied cost of equity capital and information risk measured by fair value hierarchy information in order to verify the relation between information risk and cost of capital among 200 KOSPI-listed firms in Korea. First, based on the Riedl and Serafeim (2011)'s result that information risk is related to the firm's cost of capital, we

attempt to find this relation by using the formulae (5)-(8). Furthermore, formulae (5)-(8) include the interaction term below to test the effect of the firm's ethics level on the relation between information risk and implied cost of equity capital.

$$AVG_{it} = \alpha_0 + \alpha_1 InRisk_{it} + \alpha_2 CSR * InRisk_{it} + \alpha_3 CSR_{it} + \alpha_4 SIZE_{it} + \alpha_5 BM_{it} + \alpha_6 ROE_{it} + \alpha_7 Adj\_Beta_{it} + \alpha_8 DA_{it} + \alpha_9 AQ_{it} + \Sigma INDUS + \Sigma YEAR \epsilon_{it} \quad (5)$$

$$GM_{it} = \alpha_0 + \alpha_1 InRisk_{it} + \alpha_2 CSR * InRisk_{it} + \alpha_3 CSR_{it} + \alpha_4 SIZE_{it} + \alpha_5 BM_{it} + \alpha_6 ROE_{it} + \alpha_7 Adj\_Beta_{it} + \alpha_8 DA_{it} + \alpha_9 AQ_{it} + \Sigma INDUS + \Sigma YEAR \epsilon_{it} \quad (6)$$

$$PEG_{it} = \alpha_0 + \alpha_1 InRisk_{it} + \alpha_2 CSR * InRisk_{it} + \alpha_3 CSR_{it} + \alpha_4 SIZE_{it} + \alpha_5 BM_{it} + \alpha_6 ROE_{it} + \alpha_7 Adj\_Beta_{it} + \alpha_8 DA_{it} + \alpha_9 AQ_{it} + \Sigma INDUS + \Sigma YEAR \epsilon_{it} \quad (7)$$

$$MPEG_{it} = \alpha_0 + \alpha_1 InRisk_{it} + \alpha_2 CSR * InRisk_{it} + \alpha_3 CSR_{it} + \alpha_4 SIZE_{it} + \alpha_5 BM_{it} + \alpha_6 ROE_{it} + \alpha_7 Adj\_Beta_{it} + \alpha_8 DA_{it} + \alpha_9 AQ_{it} + \Sigma INDUS + \Sigma YEAR \epsilon_{it} \quad (8)$$

AVG_{it} : The average value of cost of equity estimated by GM, PEG and MPEG for firm i at year t

GM_{it} : The value of cost of equity estimated by GM for firm i at year t

PEG_{it} : The value of cost of equity estimated by PEG for firm i at year t

$MPEG_{it}$: The value of cost of equity estimated by MPEG for firm i at year t

$InRisk_{it}$: Assets listed as levels 2 and 3 fair value divided by total fair value assets for firm i at the end of year t

$InRisk * CSR_{it}$: The InRisk multiplied by the CSR dummy as an interaction term for firm i at year t

CSR_{it} : The CSR dummy (1 if listed in SRI index for firm i at year t; otherwise 0)(17)

$SIZE_{it}$: The natural log of the market value for firm i at year t

BM_{it} : The book value of the equity divided by the market value of equity for firm i at year t

ROE_{it} : The income divided by the average book value of the equity for firm i at year t

Adj_Beta_{it} : The coefficient from the regression of firm i's weekly stock returns for year t+1 regressed on the weekly value-weighted stock market returns for year t+1

DA_{it} : Discretionary accruals value for firm i at year t

AQ_{it} : Accruals quality value for firm i at year t.

To control the effect of other determinants on the implied cost of equity capital or cost of debt capital, we adopt control variables such as firm size, book to market ratio (BM), ROE, Adj_BETA, discretionary accruals (DA) and accruals quality (AQ). First, firm size (SIZE)

is negatively related to market risk and also likely to have higher liquidity, which results in stronger financial stability (Botosan and Plumlee, 2002). Thus, large firms have lower cost of capital. Second, BM is likely to reflect another type of risk [18] as market beta estimates the firm's systematic risk Fama-French (1992). Therefore, we expect that BM has a positive (+) relation with a firm's implied cost of capital. Third, since ROE represents the firm's profitability, if the firm has higher ROE, the firm's default risk decreases, compared to that of the firms with low ROE (Francis et al., 2005). Thus, we expect that ROE is negatively related to cost of capital. Fourth, if the firm is highly susceptible to market volatility, the cost of capital for the firm increases simultaneously. Therefore, we expect that if the firm has higher beta, it is positively related to cost of capital. Fifth, with DA, representing the amount of DA, higher DA reflects the firm's earnings management behavior. The earnings management is the result of the managers' opportunistic behavior, and ultimately this is regarded as the main cause of agency problems. Thus, we expect that DA is positively related to cost of capital (Francis et al., 2004, 2005). Finally, AQ represents the reporting quality by mapping current earnings and prior, current and next cash flow (Dechow and Dichev, 2002). Francis et al. (2004) report that the higher the volatility of accruals (AQ), the more likely the firm's cost of capital is to increase simultaneously. Therefore, we expect that AQ is positively associated with the firm's cost of capital.

4. Empirical Analysis

4.1 Sample Data

This paper tests the relation between information risk measured by fair value hierarchy information and the firm's cost of capital. We have selected the sample period from 2011 to 2012 because the fair value hierarchy information has been disclosed since 2011. [19] The sample solely includes the 200 KOSPI firms since we expect large companies' disclosure to be more reliable than that of smaller firms. The other motivation for this selection is that the analysts' EPS future forecast consensus data of the 200 KOSPI firms are more accessible. Thus, we use the 200 KOSPI firms from 2011 to 2012 in order to find the relation between information risk and cost of capital. Financial data of the firms is available from FNguide Pro, and we collect the fair value hierarchy information [20] from DART. To examine the effect of the firm's ethical behavior on the relation between information risk and cost of capital, we use the Social Responsible Investment (SRI) index provided by the Korea Exchange (KRX) as proxy of firm's ethical behavior. For the sensitivity test regarding the first hypothesis, we use the weekly return data from FNguide Pro to measure the 60-month weekly rolling beta. Finally, we also use the financial data and return data provided by FNguide Pro to establish the control variables in each model. Our variables in

each model are winsorized within 1% to restrict the outliers. As a final sample, we use 277 firm-year observations among the 200 KOSPI firms from 2011 to 2012.

4.2 Empirial Results

4.2.1 Descriptive Statistics and Correlation Analyses

<Table 1> presents the descriptive statistics of the main variables. AVG, which is used to test the relation between information risk measured by fair value hierarchy information and cost of equity capital as one of the main dependent variables, has a mean (median) value of 13.72% (12.79%). The mean (median) values of implied cost of equity capital estimated by the GM, PEG and MPEG models are 13.23% (12.03%), 13.67% (12.60%) and 14.68% (13.30%), respectively. The information risk measure (InRisk) as a main dependent variable has a mean (median) value of 49.58% (52.48%)[21].

<Table 1>
Descriptive Statistics

Variable	Obs	Mean	Std Dev	Max	Q3	Median	Q1	Min
Depnedant Variables								
AVG	306	0.1372	0.0523	0.3983	0.1548	0.1279	0.1075	0.0583
GM	315	0.1323	0.0664	0.3764	0.1620	0.1203	0.0859	0.0217
PEG	311	0.1367	0.0549	0.4110	0.1529	0.1260	0.1058	0.0540
MPEG	312	0.1468	0.0602	0.4376	0.1630	0.1330	0.1129	0.0647
CRED1	261	-1.8352	0.4074	0.0000	-1.6094	-1.9459	-2.0794	-2.3026
CRED2	182	-2.2143	0.1709	-1.0986	-2.1972	-2.3026	-2.3026	-2.3026
Experimental Variables								
InRisk	277	49.58%	39.45%	100.00%	90.12%	54.28%	6.82%	0.00%
Control Variables								
SIZE	399	21.2458	1.3645	24.6582	22.2808	21.2924	20.0178	19.1604
BM	365	1.3032	2.5048	19.6154	1.2517	0.7759	0.4697	0.0196
ROE	366	6.72%	13.78%	36.70%	12.55%	7.61%	3.14%	-61.22%
BetaA	398	0.8148	0.4787	1.8910	1.1831	0.8334	0.4705	-0.2344
DA	361	0.0536	0.0546	0.2678	0.0682	0.0356	0.0167	0.0005
AQ	360	0.0567	0.0431	0.2510	0.0663	0.0457	0.0285	0.0071
Variables for Sensitivity Analyses								
BetaB (2 year weekly)	398	0.9183	0.4206	1.7785	1.2499	0.9144	0.5839	-0.0366
BetaC (1 year daily)	398	0.8839	0.4381	1.7840	1.2023	0.8825	0.5263	0.0928

This table shows descriptive statistics for the variables used in the main regression analyses. The number of the sample based on level data from each firm's F/S is 277 firm-year observations (N=277). All the variables for the analyses are winsorized within 1% of the outliers.

<Table 2> suggests the correlation result of the main variables. First, the coefficient between AVG and InRisk is 0.115 (P-value: 0.088); this supports the notion that high information risk leads to high implied cost of equity capital. In addition, the interaction term for the effect of the firm's ethical behavior on the relation between information risk and cost of equity capital (InRisk*CSR) shows a negative (-) relation, from which we deduce that the firm's ethical behavior weakens the relation between information risk and cost of equity capital. The firm size (SIZE) is negatively (-) related to cost of capital. Contrary to our prediction, however, BM is inconsistently related with cost of capital. (22) The firm's profitability (ROE) shows an almost negative (-) relation with cost of capital, which indicates that the firm with high profitability receives concrete trust from market participants. The firm's systematic risk (BETA) is positively (+) related to cost of capital, as expected. Finally, we found a positive relation between accounting reporting quality (DA & AQ) and cost of capital.

<Table 2>
Correlation Matrix for Main Variables

Variables	AVG	GM	PEG	MPEG	InRisk	IR* CSR	CSR	SIZE	BM	ROE	Beta	DA	AQ
(1) AVG	1.000												
(2) GM	0.823	1.000											
(3) PEG	0.882	0.507	1.000										
(4) MPEG	0.942	0.601	0.922	1.000									
(5) InRisk	0.115	0.156	0.076	0.040	1.000								
(6) IR*CS	-0.098	-0.059	-0.118	-0.121	0.3174	1.000							
(7) CSR	-0.050	-0.113	0.004	-0.019	-0.000	0.758	1.000						
(8) SIZE	-0.194	-0.220	-0.153	-0.147	0.037	0.473	0.604	1.000					
(9) BM	-0.018	-0.053	0.006	0.009	-0.038	-0.110	-0.138	-0.263	1.000				
(10) ROE	-0.213	-0.072	-0.255	-0.225	0.036	0.089	0.063	0.241	-0.076	1.000			
(11) Beta	0.099	0.094	0.121	0.051	0.113	0.225	0.254	0.162	-0.101	0.032	1.000		
(12) DA	0.222	0.212	0.198	0.170	0.112	0.019	0.021	-0.098	-0.001	-0.033	0.007	1.000	
(13) AQ	0.055	0.050	0.062	0.039	0.071	0.037	0.015	-0.007	-0.073	-0.124	0.142	0.286	1.000

This table presents results from the Pearson correlation analysis among the main variables used in the research models.

4.2.2 Main Resutls for Hypotheses (H1, H2)

4.2.2.1 Information Risk and Implied Cost of Equity Capital

<Table 3> shows the result of the test to see whether the information risk measured by fair value hierarchy information affects the implied cost of equity capital and if the firm's ethical behavior affects the relation between information risk and cost of capital. First, the results from <Column 1> to <Column 4> report the relation between

information risk and cost of capital (implied cost of equity capital estimated from GM, PEG and MPEG). AVG suggests a significant positive (+) relation with information risk (Coef=0.0232, t-value: 2.28). It also indicates that information risk (InRisk) is likely to increase the cost of capital. Furthermore, the individual implied cost of capital from the GM, PEG and MPEG models each also suggests a positive significant relation with information risk (InRisk) [23]. This indicates that when information risk (information uncertainty) is present, which may occur from producing fair value information, the higher the information risk, the higher the implied cost of equity capital.

To test the effect of the firm's ethical behavior on the relation between information risk and implied cost of equity, we find that the interaction term (InRisk*CSR) is significantly and negatively related to AVG (Coef=-0.0487, t-value: -2.45).[24] This supports the hypothesis that a firm's ethical behavior mitigates the effect of information risk that may occur through the process of fair value measurement on the firm's cost of equity capital.

<Table 3> reports the results of the main control variables as follows. First, SIZE and ROE are negatively (-) related to cost of equity capital. This indicates that if the firm is large in size and yields high profitability, the cost of capital from the financial market is lower than that of others due to its financial stability. On the other hand, BETA and DA have a positive (+) relation with cost of equity capital. BETA is regarded as a risk factor, and thus is likely to increase the cost of equity capital. Although BM is regarded as another risk factor, it shows ambiguous results. We infer that since we only take 200 KOSPI firms into account, the undervalued firms from the market are not observable. In addition, earnings management behavior (DA) is considered as a main cause of the firm's information asymmetry, which may increase the cost of equity capital (Francis et al., 2004). On the other hand, CSR is in a positive (+) relation with cost of equity capital, which indicates that the firm's external stakeholders identify CSR activities as unnecessary and irrelevant to its core competence business strategy. Given this analysis, CSR is likely to increase the firm's cost of equity capital.

<Table 3>
Impact on the Cost of Equity from Information Risk

Independent Variable	Pred. Sign	Column (1) AVG (1)		Column (2) GM (2)		Column (3) PEG (1)		Column (4) MPEG (2)	
		Coef	t-statistics	Coef	t-statistics	Coef	t-statistics	Coef	t-statistics
InRisk (H1)	**(+)**	**0.0232****	**2.28**	**0.0263****	**1.99**	**0.0255****	**2.47**	**0.0189***	**1.65**
InRisk*CSR (H2)	**(-)**	**-0.0487****	**-2.45**	**-0.0294**	**-1.18**	**-0.0652*****	**-3.25**	**-0.0603*****	**-2.69**
CSR	**(+)/(-)**	0.0267*	1.87	0.0124	0.69	0.0390***	2.74	0.0340**	2.14

Size	(-)	-0.0070*	-1.92	-0.0098**	-2.10	-0.0073*	-1.94	-0.0072*	-1.71
BM	(+)	-0.0022*	-2.01	-0.0035**	-2.45	-0.0015	-1.30	-0.0016	-1.30
ROE	(-)	-0.1007***	-3.26	-0.0395	-0.99	-0.1055***	-3.81	-0.1071***	-3.46
Adj_Beta	(+)	0.0058	0.76	0.0031	0.32	0.0144*	1.90	0.0094	1.11
DA	(+)	0.1703***	2.72	0.1656**	2.05	0.1888***	2.94	0.1757**	2.45
AQ	(+)	0.0601	0.65	-0.0208	-0.18	0.0530	0.57	0.0432	0.41
IndusDummy		*Included*		*Included*		*Included*		*Included*	
YearDummy		*Included*		*Included*		*Included*		*Included*	
R^2		0.25		0.18		0.28		0.23	
Adj_R^2		0.18		0.10		0.21		0.15	
F-value		3.30		2.21		3.98		2.94	
P-value		<0.01		<0.01		<0.01		<0.01	
VIF		3.82		3.79		3.89		3.89	
Num of obs		205		211		210		210	

This table presents results from the regression analyses (H1) of the effect of information risk measured by fair value disclosures (levels 1, 2 and 3) on the cost of equity by using AVG (with the average value estimated in the GM, PEG and MPEG models). The information risk (InRisk) measured the sums of levels 2 and 3 at fair value disclosure. Across all regressions, N=205 for AVG firm-years. We also suggest the results from the regression of GM, PEG and MPEG with similar results with AVG. We suggest coefficient estimates, followed by ***, ** and * indicating significance levels of 1%, 5%, and 10%, respectively. Column 1 shows the coefficient value, wherein the dependent variable is AVG, with financial asset at fair value summed into levels 2 and 3 as the proxy for information risk (InRisk). Columns 2, 3 and 4 present the results from similar regression analyses as Column 1 with cost of equity capital estimated through the GM, PEG and MPEG models dependent variable, respectively.

5. Additional Tests

5.1 Adj_Beta from Market Model

We test whether information risk measured by fair value information affects the implied cost of equity capital (estimated by the GM, PEG and MPEG models). We add the test of whether the information risk is related to market systematic risk (BETA)[25] estimated by the market model. The market model is used to generate the cost of equity capital from the firm's systematic risk factor. Thus, we use the historical rolling window one-factor model on a weekly return basis[26], 2-year beta with weekly return and 1-year daily return to test the relation of information risk measured by fair value hierarchy. First, we separate High_InRisk and Low_InRisk. Then we conduct a t-test to compare the average of two groups. <Table 4> suggests the result in terms of average of each beta between High_InRisk and Low_InRisk with 2 deciles. <Panel A> in <Table 4> shows the result of t-test between High_InRisk (0-50%) and Low_InRisk (51-100%). The average beta is significantly different in each group (BetaA: p-value=0.0463, BetaB: p-value=0.0977, BetaC: p-value=0.0567). In <Panel B>, the groups are separated by 3 deciles. High_Risk

(0-33%) and Low_InRisk are significantly different in each group (BetaA: p-value=0.0443, BetaB: p-value=0.0517, BetaC: p-value=0.0412). These results indicate that if the firm's information risk is higher than that of others, it is related to a higher cost of equity capital. This robust result supports the positive (+) relation between information risk and cost of equity capital.

<Table 4>
t-test for Information Risk with Cost of Equity Capital (Beta)

<Panel A>

Class (Information Risk)	Cost of Equity Capital		
	BetaA	BetaB	BetaC
Low Rank (0-50%)	0.7681 (139)	0.9134 (139)	0.8757 (139)
High Rank (51-100%)	0.8673 (138)	0.9804 (138)	0.9618 (138)
Total	0.8175 (277)	0.9468 (277)	0.9186 (277)
Ha: Diff<0	P-value: 0.0463	P-value: 0.0977	P-value: 0.0567

<Panel B>

Class (Information Risk)	Cost of Equity Capital		
	BetaA	BetaB	BetaC
Low Rank (0-33%)	0.7037 (93)	0.8734 (93)	0.8490 (93)
High Rank (67%-100%)	0.8273 (92)	0.9799 (92)	0.9695 (92)
Total	0.7652 (185)	0.9264 (185)	0.9089 (185)
Ha: Diff<0	P-value: 0.0443	P-value: 0.0517	P-value: 0.0412

This table presents results from the t-test to compare the mean of beta by low and high information risk. Beta(1) is the rolling beta over 5 years with weekly returns. On the other hand, Beta(2) shows the historical beta over 2 years with weekly returns. Beta(3) represents the historical beta over 1 year with daily returns. In Panel A, we divide the class into 2 deciles (0-50% and 51-100%). Panel B, on the other hand, is divided into 3 deciles (0-33%, 34-66% and 67-100%). Finally, we define P-value < 0.05 as the significance level.

5.2 Information Risk with Implied Cost of Equity Capital

We add the t-test result to show whether higher (lower) information risk is related to higher (lower) implied cost of equity. <Table 5> reports the result in terms of difference of High_InRisk and Low_InRisk with implied cost of equity capital estimated by the GM, PEG and MPEG models. First, <Panel A> suggests the average difference between High_InRisk (0-50%) and Low_InRisk (51-100%) with 2 deciles. The results by AVG and GM show significant differences (AVG: p-value=0.0919, GM: p-value=0.0381). In <Panel B>, the groups are separated into 3 one-thirds, the High_Risk (0-33%) and Low_InRisk are significantly different in each group (AVG: p-value=0.0530, GM: p-value=0.0141). Thus, these results are consistent to our expectation that higher (lower) information risk is likely to lead a higher (lower) cost of equity capital.

<Table 5>
t-test for Information Risk with Implied Cost of Equity Capital

<Panel A>

Class (Information Risk)	Implied Cost of Equity Capital			
	AVG	GM	PEG	MPEG
Low Rank (0~50%)	0.1312 (116)	0.1238 (120)	0.1322 (119)	0.1433 (119)
High Rank (51~100%)	0.1401 (107)	0.1387 (109)	0.1380 (109)	0.1464 (109)
Total	0.1354 (223)	0.1309 (229)	0.1350 (228)	0.1448 (228)
Ha: Diff<0	P-value: 0.0919	P-value: 0.0381	P-value: 0.2016	P-value: 0.3337

<Panel B>

Class (Information Risk)	Implied Cost of Equity Capital			
	AVG	GM	PEG	MPEG
Low Rank (0~33%)	0.1322 (77)	0.1185 (78)	0.1345 (79)	0.1465 (79)
High Rank (67%~100%)	0.1473 (71)	0.1432 (73)	0.1456 (72)	0.1533 (72)
Total	0.1395 (148)	0.1304 (151)	0.1398 (151)	0.1497 (151)
Ha: Diff<0	P-value: 0.0530	P-value: 0.0141	P-value: 0.1188	P-value: 0.2523

This table presents results from the t-test to compare the mean of cost of equity capital by low and high information risk. First, we use the AVG, the average value of implied cost of equity capital estimated using the GM, PEG and MPEG models. We suggest the results of GM, PEG and MPEG above. In Panel A, we divide the class into 2 deciles (0-50% and 51-100%) and Panel B into 3 deciles (0-33%, 34-66% and 67-100%). Finally, we define P-value < 0.05 as the significance level.

6. Conclusion

This paper has examined whether the information risk measured by fair value hierarchy information affects a firm's cost of capital. Our sample includes 200 KOSPI firms of 2011 and 2012. We assume that the information risk of levels 2 and 3 is higher than that of level 1 and examine whether information risk is positively related to implied cost of equity and cost of debt capital. The results reveal that information risk generated from information uncertainty is likely to increase the implied cost of capital based on the analyst forecast. Finally, we find that a firm's ethical behavior (CSR activities) affects the production procedure of accounting information, especially fair value hierarchy information; ultimately, this effect is likely to decrease the firm's cost of capital.

Our contribution and results can be summarized as follows. First, we have examined the firm's information risk derived from the level hierarchy information and

whether the level hierarchy information can be used as a determinant of a firm's cost of capital. While Riedl and Sarafeim (2011) use the absolute value of each level to verify its relevance to financial risk, we develop an information risk measure, i.e., ((Levels 2+3)/(Level total)), as we consider that levels 2 and 3 contain higher information risk than level 1 does (Kolev, 2009; Goh et al., 2009 and Song et al., 2010) The result shows that the measured information risk from the level hierarchy information is positively related with AVG, which is a proxy for the firm's cost of capital. This result is consistent with previous results (Easley and O'Hara, 2004; Lambert et al., 2007; Riedl and Serafeim 2011). Second, we test whether the firm's ethical behavior affects the relation between information risk and cost of capital. Kim et al. (2012) and Lim et al. (2013) report that firm's ethical behavior (CSR activity) mitigates information asymmetry. Furthermore, Kim et al. (2011) and Kim et al. (2012) report that a firm's ethical behavior can be a determinant of the firm's cost of capital. Based on these findings, we assume that the firm's ethical behavior affects the relation between information risk and cost of capital and show that the firm's ethical behavior mitigates the effect of information risk and consequently diminishes the cost of capital.

To deal with the information uncertainty generated during the production of fair value hierarchy information, these findings provide us with sufficient evidence to emphasize the necessity for a consistent fair value evaluation system, such as improved fair value measurement and reinforcement of a monitoring system for fair value evaluation.

Notes

(1) On the other hand, Barth et al. (1998) report that fair value information is more reliable than historical accounting information since the fair value accounting information is measured based on the firm's private information.

(2) As a proxy for implied cost of equity capital, we use the averaged implied cost of equity capital, estimated with GM, PEG and MPEG models based on the data from analyst future EPS consensus provided by FNguied Pro.

(3) In this paper, the sample is based on 200 KOSPI firms in 2011 and 2012, whose financial statements are provided in DART (Data Analysis, Retrieval and Transfer System).

(4) Information risk representing the firm's information asymmetry is measured based on the level information given in the firm's financial statements (supplementary schedules).

1) InRisk = (Level2+Level3) / Total Level

(5) Kim et al. (2011) report that the firm's ethical behavior through CSR activities results in the firm's information asymmetry issues, caused by earnings management. Therefore, we assume that firm's ethical behavior is likely to diminish the firm's information asymmetry.

(6) Kim et al. (2011) define a sin company as those involved in game, tobacco, alcohol and adult entertainment industries and report whether a sin company's capital cost is higher than that of a typical company.

(7) This figure is based on the Song and No (2011)'s report.

(8) Francis et al. (2004) use various accounting attributes (Accruals Quality, Persistence, Predictability, Smoothness, Value Relevance, Timeliness and Conservatism) as information risk measures.

(9) Lim et al. (2013) identify the firm's ethical behavior in terms of internal (earning management behavior) and external (CSR activities) aspects. Accordingly, we assume that CSR activities represent the firm's

external ethical aspect.

(10) We use the analyst's future EPS forecast data from FNguide Pro, $FEPS_{t+1}$ and $FEPS_{t+2}$, which is provided 6 months prior to t.

(11) Whang et al. (2007) and Na and Leem (2014) subtract 3% from the Treasury bond return to calculate the constant growth rate, which is applied to GM model to estimate the implied cost of equity capital. We apply the same method to the model for this study.

(12) If $FEPS_{t+2}$ is less than $FEPS_{t+1}$, we substitute 0 for forecasted EPS consensus change ($FEPS_{t+2} - FEPS_{t+1}$). Also, when the value in the radial sign is negative (-), the firm's implied cost of equity capital is replaced with the value of A ($1/2(r_f\text{-}0.03)+DPS_{t+1}/P_t)$) (Ahn et al., 2005).

(13) If $FEPS_{t+2}$ is less than $FEPS_{t+1}$, we use the implied cost equity capital estimated with the PEG model, instead of the GM model.

(14) The assumption put forth by Ohlson and Juettner-Nauroth (2005)'s model is built in the MPEG model that firm's excess growth is an unbiased estimator of firm's future growth (Easton, 2004).

(15) Riedl and Serafeim(2011) use the level variable for each level of the hierarchy divided by the firm's total asset as a proxy for information risk. We suggest a new information risk measure, where the sum of levels 2 and 3 is divided by the total level (InRisk=(Level2+Level3)/(Total Level) since levels 2 and 3 contain more information uncertainty than level 1 (Song et al., 2010; Riedl and Serafeim, 2011).

(16) This indicates the average value of implied cost of equity capital estimated using the GM, PEG and MPEG models.

(17) We hypothesize that firm's ethical behavior (CSR activities) is likely to affect the relation between information risk and capital cost, and thus we adopt the SRI (Social Responsible Investment) index disclosed in KRX (Korea Exchange). We designate 1 (CSR=1) if the firm is included in the SRI index, otherwise 0 (CSR=0).

(18) According to Fama-French(1998), BM (book-to- market ratio) is regarded as a systematic risk factor since its relevance to systematic risk increases if the stock in question is underestimated in the market due to the investors' indifference.

(19) Korea has adopted the K-IFRS (Korean International Financial Reporting Standards) since 2011 and disclosed fair value hierarchy information. Accordingly, our sample period is from 2011 to 2012.

(20) The fair value hierarchy information is generally disclosed in the firm's financial statement (supplementary schedules), and therefore, we collect the levels 1, 2 and 3 data from the firm's financial statement available from DART (Data Analysis, Retrieval and Transfer System).

(21) This mean or median value is the winsorized value to minimize the loss of sample and to control outlier observations. Before the winsorization, the mean (median) value of level 1 is 50.42% (45.72%), and the mean (median) value of level 3 is 21.79% (5.63%). The sum of levels 2 and 3 for the proxy for information risk (InRisk) is 49.58% (54.28%).

(22) We infer that the firm's growth, represented by BM, is insignificant since the sample only includes KOSPI 200 firms.

(23) The coefficient of InRisk represents a significant positive value (+) with the implied cost of equity capital estimated through the GM model (Coef=0.0263, t-value: 1.99). The result of InRisk with the implied cost of equity capital estimated through the PEG and MPEG models shows a significant positive relation. (1] PEG: Coef=0.0255, t-value: 2.47 2] MPEG: Coef=0.0189, t-value: 1.65).

(24) The interaction term (InRisk*CSR) to show the effect of a firm's ethical behavior on the relation between information risk and capital cost (implied capital cost estimated by PEG and MPEG) suggests the negative sign (-), with significance. (1] PEG: Coef=-0.0652, t-value: -3.25 2] MPEG: Coef=-0.0603, t-value: -2.69).

(25) In <Table 4>, the adj_BETA is replaced with BetaA.

(26) We estimate adj_BETA as a proxy for the firm's cost of equity capital based on the one-factor model, which conducts 5-year (60 prior months) rolling window regression since 01/01/2007 (time t = 12/31/2011) (Fama-Macbeth, 1973).

$R_i - R_f = \alpha_i + \beta_i \cdot (R_m - R_f) + e_i$

1) R_{it} : the weekly individual return for firm i at time t 2) R_{ft}: risk free rate at time t (3 year Treasury Bond rate) 3) R_{mt}: market index (portfolio) return at time t 4) β_{it}:

rolling window regression beta for firm i at time t 5) e_{it}: error term of rolling window regression for firm i at time t

References

Aboody, D., M. E. Barth, and R. Kasznik. 2006. Do Firms Understate Stock Option-based Compensation Expense Disclosed under FAS 123? *Review of Accounting Studies* 11(4): 429–461.

Ahn, T. S. and J. H. Lee. 2005. Determinants of Voluntary Disclosures in Overview of Operations–Korean Evidence. *Korean Accounting Review* 30(2): 33-78. [Printed in Korean]

Attig, Najah; El Ghoul, Sadok; Guedhami, Omrane, and Suh, Jungwon. 2013. Corporate Social Responsibility and Credit Ratings *Journal of Business Ethics.* Vol. 117 Issue 4: 679-694.

Barth, M. E. 1994. Fair Value Accounting: Evidence from Investment Securities and the Market Valuation of Banks. *The Accounting Review* 69 (1): 1–25.

Barth, M. E., and G. Clinch. 1998. Revalued Financial Tangible, and Intangible Assets: Associations with Share Prices and Non-market-based Value Estimates. *Journal of Accounting Research* 36(3): 199–233.

Barth, M. E., W. H. Beaver, and W. R. Landsman. 1996. Value-relevance of Banks' Fair Value Disclosures under FAS No. 107. *The Accounting Review* 71 (4): 513–537.

Bartov, E., P. Mohanram, and D. Nissim. 2007. Managerial Discretion and the Economic Determinations of the Disclosed Volatility Parameter for Valuing ESOs. *Review of Accounting Studies* 12(1): 155–179.

Bhattacharya, U. and M. Spiegel 1991. Insiders, Outsiders and Market Breakdowns. *Review of Financial Studies* 4(2): 255-282.

Botosan, C. A. 1997. Disclosure Level and the Cost of Equity Capital. *Accounting Review* 72: 323–50.

Botosan, C. A. and M. A. Plumlee. 2005. Assessing Alternative Proxies for the Expected Risk Premium. *Accounting Review* 80(1): 21-53.

Bushman, R. M. and A. j. Smith. 2001. Financial Accounting Information and Corporate Governance. *Journal of Accounting and Economics* 32: 237-333.

Cho. S., C. Lee and R. Pfeiffer. 2012. Corporate Social Responsibility Performance Information and Information Asymmetry. *Journal of Accounting and Public Policy* 32(1): 71-83.

Dechow. P. M. and D. Dichev, 2002. The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. *The Accounting Review*. 77(1): 35-59.

Dhaliwal, D. S., O. Z. Li, A. Tsang, and Y. G. Yang. 2011. Voluntary Non-financial Disclosure and Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. *Accounting Review* 86(1): 59-100.

Diamond D., and R. Verrecchia. 1991. Disclosure, Liquidity, and the Cost of Capital. *Journal of Finance* 46: 1325- 59.

Easley, D., and M. O'Hara. 2004. Information and the Cost of Capital. *Journal of Finance* 59: 1553–83.

Easton, P. 2004. PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital. *The Accounting Review* 79(1): 73-95.

Eccher, Elizabeth A., Ramesh, K., Thiagarajan, S., and Ramu. 1996. Fair Value Disclosures by Bank Holding Companies. *Journal of Accounting & Economics*. Vol. 22 Issue 1-3: 79-117.

Elton, E. J. 1999. Expected Return, Realized Return, and Asset Pricing Tests. *Journal of Finance* 54(4): 1199-1220.

Fama, E., and J. MacBeth. 1973. Risk, Return and Equilibrium: Empirical Test. *Journal of Political Economics* 81: 607-636.

Fama, E., and K. French. 1997. Industry Costs of Equity. *Journal of Financial Economics* 43: 153-193.

Fama, E. F., and K. R. French. 1992. The Cross-Section of Expected Stock Returns. *Journal of Finance* 47(2): 427-465.

Fama, E. F., and K. R. French. 1996. Multi-factor Explanation of Asset Pricing Anomalies. *Journal of Finance* 51: 55-84.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2004. Costs of Equity and Earnings Attributes. *The Accounting Review* 79 (4): 967–1010.

Gode, D., and P. Mohanram. 2003. Inferring the Cost of Capital Using the Ohlson-Juettner Model. *Review of Accounting Studies* 8: 399-431.

Goh, B., J. Ng, and K. Yong. 2009. Market Pricing of Banks' Fair Value Assets Reported under SFAS 157 during the 2008 Economic Crisis. *Working paper, Singapore Management University.*

Hwang, L. S., W. J. Lee, and S. Y. Lim. 2008. Korean Evidence on the Implied Cost of Equity. *Korean Accounting Journal* 39 (1): 229-253.

Kim, Irene; Venkatachalam, and Mohan. 2011. Are Sin Stocks Paying the Price for Accounting Sins? *Journal of Accounting, Auditing & Finance.* Vol. 26 Issue 2: 415-442.

Kim, K. J and M. Kim. 2000. Value Relevance of Fair Value Disclosure by Financial Institutions. *Korean Accounting Review* 25: 133-159.

Kim, S., W. Park and Lee, H. 2001. Value Relevance of Gain/Loss on Sale of Securities and Unrealized Holding Gain/Loss on Securities. *Korean Accounting Review* 27: 117-139.

Kim, Y., M. Park. and Benson W. 2012. Is Earnings Quality Associated with Corporate Social Responsibility?. *The Accounting Review* 87(3): 761-796.

Klein, A. 2002. Audit Committee, Board of Director Characteristics, and Earnings Management. *Journal of Accounting and Economics*. 33(August): 357-400.

Kolev, K. 2009. Do Investors Perceive Marking-to-model as Marking-to-myth? Early Evidence from FAS No. 157 Disclosure. *Working paper, New York University.*

Lambert, Richard Leuz, Christian Verrecchia, and Robert E. 2007. Accounting Information, Disclosure, and the Cost of Capital. *Journal of Accounting Research*. Vol. 45 Issue 2: 385-420.

Landsman, W. R. 2007. Is Fair Value Accounting Information Relevant and Reliable? Evidence from Capital Market Research. *Accounting and Business Research (Special Issue: International Accounting Policy Forum)*: 19–30.

Lim, H. J and J. S. Park. 2013. Corporate Social Responsibility and Earnings Management: Does the External Business Ethics Portray Internal Ethics?. *Korean Accounting Journal* 22: 257-310.

Na. Y and W. Leem. 2014. An Empirical Analysis on Association between Fair Disclosure and the Cost of Equity Capital. *Korean Accounting Review*. 39 (1): 1-42.

Nelson, K. 1996. Fair Value Accounting for Commercial Banks: An Empirical Analysis of FAS No.107. *The Accounting Review* 71(2): 161–182.

Ohlson, J. A., and B. E. Juettner-Nauroth. 2005. Expected EPS and EPS Growth as Determinants of Value. *Review of Accounting Studies* 10(2): 349-376.

Penman, S. H. 2007. Financial Reporting Quality: Is Fair Value a Plus or a Minus? A*ccounting and Business Research (Special Issue: International Accounting Policy Forum)*: 33–44.

Riedl, E. J. and G. Serafeim. 2011. Information Risk and Fair Values: An Examination of Equity Betas. *Journal of Accounting Research* 49(4): 1083-1122.

Song, C., W. Thomas, and H. Yi. 2010. Value Relevance of FAS 157 Fair Value Hierarchy Information and the Impact of Corporate Governance Mechanisms. *Accounting Review* 85: 1375–410.

Song, I and H. No. 2011. IFRS and Fair Value Accounting for Financial Instruments. *Korea Institute of Finance*. 3: 1-103.

Song, J. M., and H. S. Kim. 2011. A Case Study Based on the Measuring Fair Value of Liabilities. *Korean Accounting Journal* 20: 395-422.

Xie, H. 2001. The mispricing of abnormal accruals. *The Accounting Review* 76: 357-373.

Yoon, S. J., Y. H., Park and Cho, H. W. 2007. The The Information Usefulness of Fair Value Disclosures for Investments in Stocks Accounted for under the Equity Method. *Korean Accounting Journal* 16 (1): 1-27.

Zhang, M. H, 2005. The Differential of Proprietary Cost on the Quality versus Quantity of Voluntary Corporate Disclosures, *Dissertation Paper (University of Texas at Austin)*