Is Accounting Information Quality Priced in Korea?

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There has been a debate as to whether accounting information quality priced on asset returns and systematically affects the cost of capital of firms in the world market. In this paper, we examine whether there is a relationship between accounting information quality proxied by accruals quality in the Korean markets, and whether it does affect the cost of capital. Although accruals quality is linked with some variables representing the uncertainty of future cash flows and thus it could be a good proxy for a risk, we find no evidence, unlike in the U.S, that this risk is systematically priced in stock returns and it does affect the cost of capital in Korea. Specifically, after controlling for the factors affecting the cost of debt and the cost of equity, we find that the proxy variable for accounting information quality has no significant relation with the cost of debt and the cost of equity. In particular, there is a flat relation between average stock returns and accruals quality. We also provide another perspective in examining whether accounting information quality affects the cost of equity capital. If accounting information quality affects the cost of equity, as accounting information quality becomes poorer, investors would require a greater risk premium associated with the well-know risk factor such as firm size, book-to-market, and price momentum. However, we find no evidence supporting this.

Keywords: Accounting information quality, Accruals quality, Risk premium, Cost of capital, Risk factor models

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Abstract:

There has been a debate as to whether accounting information quality priced on asset returns and systematically affects the cost of capital of firms in the world market. In this paper, we examine whether there is a relationship between accounting information quality proxied by accruals quality in the Korean markets, and whether it does affect the cost of capital. Although accruals quality is linked with some variables representing the uncertainty of future cash flows and thus it could be a good proxy for a risk, we find no evidence, unlike in the U.S, that this risk is systematically priced in stock returns and it does affect the cost of capital in Korea. Specifically, after controlling for the factors affecting the cost of debt and the cost of equity, we find that the proxy variable for accounting information quality has no significant relation with the cost of debt and the cost of equity. In particular, there is a flat relation between average stock returns and accruals quality. We also provide another perspective in examining whether accounting information quality affects the cost of equity capital. If accounting information quality affects the cost of equity, as accounting information quality becomes poorer, investors would require a greater risk premium associated with the well-know risk factor such as firm size, book-to-market, and price momentum. However, we find no evidence supporting this.

1. Introduction

Recently, the issue of whether firm's accounting information quality is priced and whether accruals quality affects the cost of capital has been controversial to many researchers. The controversy is focused on the issue that the disclosure of high quality of accounting information reduces uncertainty of investment environments that investors will face and lowers the cost of capital of firms, because investors demand higher returns for firms with poor accounting information quality, while they pay more for firms with high accounting information quality. Therefore, low (high) accounting information quality implies high (low) information uncertainty and high (low) risk for investors.

Although rationale of the accounting quality-risk-cost of capital story sounds rational, there are still no clear conclusions of whether accounting information quality is priced and has an influence on the cost of capital. There are many empirical articles arguing that information quality affects the cost of capital.[1] Easley, Hvidkjaer, and O'Hara (2002) report that when a microstructure model is used, information-based trading produces higher stock returns and information affects asset prices. O'Hara (2003) suggests that firms' accounting treatment of earnings and disclosure policy will affect returns. Easley and O'Hara (2004) analyze the roles of public and private information to determine the cost of capital and market price. They suggest that investors think a firm with higher private information but with lower public information as riskier and require a higher return. They argue that both the quantity and quality of information which a firm provided would have an effect on equilibrium asset prices. Botosan (1997) and Botosan and Plumlee (2002) examine the association between the cost of capital and the information disclosure level, and find that the greater disclosure is associated with a lower cost of equity capital.

Among many papers, an influential paper by Francis, LaFond, Osson, and Schipper

[1] There are also many theoretical articles regarding the relation between information quality and cost of capital. Among them, Diamond and Verrecchia (1991) show that a reduction of information asymmetry among investors by revealing public information can reduce a firm's cost of capital. On the other hand, Hughes, Liu, and Liu (2007) argue that the effect of information asymmetry is eliminated in an economy with a large number of risky assets, and the uncertainty arising from information quality is fully diversifiable and thus is not priced. Lambert, Leuz, and Verrecchia (2007) develop a model consistent with the Capital Asset Pricing Model (CAPM) to show how accounting information could affect the systematic risk of a firm and to show that accounting information affects investors' *assessment* of the covariance of a firm's cash flows with those of the market. Their model is built on the logic of the CAPM and the idea of "estimation-risk". Hence, a well-specified forward-looking beta will fully capture the cross-sectional difference in the expected returns. However, if beta is not precisely estimated, a proxy for information risk which captures the expectation of risk could appear to be a priced risk factor.

(2005) (hereafter, FLOS) has recently drawn much interest from academics. By using the U.S. data, FLOS examine the relation between accounting information quality proxied by accruals quality (AQ), and suggest evidence that U.S firms with low AQ have a higher cost of capital rather than firms with high AQ. FLOS separate the total accruals quality into the innate accruals quality reflecting economic fundamentals and the discretionary accruals quality reflecting managerial decisions. They show that the innate and discretionary AQ's also are associated with the cost of capital.

Core, Guay, and Verdi (2007), however, argue that FLOS's testing methodology is flawed. That is, the statistically significantly positive average coefficient on the AQ factor in FLOS's time-series regressions does not necessarily indicate that accruals quality (or equivalently, accounting information quality) is a priced factor. Within Fama-MacBeth's (1973) two-stage testing methodology, they estimate the cross-sectional regressions (CSR) of stock returns on the estimated beta on the AQ risk factor in order to test if the AQ factor is priced. They argue that the AQ factor is not priced, because the CSR coefficients on the AQ betas are not statistically significant. However, Kim and Qi (2008) recently argue that Core, Guay, and Verdi's results are mostly driven by low-priced stocks. After excluding the low-priced returns, Kim and Qi provide evidence that AQ is priced.

The purpose of this paper, therefore, is to examine whether accounting information quality proxied by accruals quality as in Francis et al. (2005) is priced and whether accounting information quality affects the cost of capital in Korea. Despite the difference in regulatory and institutional environments associated with the flow of accounting information and accounting standard between Korea and the U.S., this study may offer interesting insights to investors in Korea. This study is the first one to examine the relation between accounting information quality and the cost of capital in the Korean markets by using accruals quality, not accruals itself.[2]

In order to test whether there is a pricing relation between accounting information quality proxied by AQ and stock returns, we first construct a zero-investment arbitrage portfolio based on AQ, and regard this as a risk factor related to accounting information quality, as FLOS did. Using Fama-MacBeth's (1973) two-pass methodology, unlike in the U.S., we find no evidence that AQ is priced in Korea. We also investigate whether AQ is related with a measure of the cost of equity capital and the cost of debt. The industry-adjusted

[2] Kho and Kim (2007) used accruals itself, not accruals quality, in order to investigate whether an anomaly caused by accruals is significant in the Korean markets.

earnings-price ratio is used for the cost of equity capital, and the interest expenses divided by the total debt is used for the cost of debt. We also find no evidence that AQ is related with the cost of equity capital or the cost of debt. In order to elaborate the role of accounting information quality in explaining the cost of capital, we decompose accounting information quality into two parts; one caused by the fundamental factors of the firm such as firm size, volatilities of sales and cash flows, and earnings variability, and another caused by the discretion by management. The former is called the innate AQ, and the latter the discretionary AQ. Unlike in FLOS, however, there is no significant evidence that the innate AQ and discretionary AQ are related with the cost of capitals.

The rest of the article is organized as follows: Section 2 describes the data that we use and how to measure accruals quality (AQ) and innate accruals quality (IAQ), and discretionary accruals quality (DAQ). Section 3 mentions the construction of AQ portfolios and characteristics of portfolios sorted on AQ. Section 4 shows the relation between accounting information quality and cost of capital. Section 5 offers another evidence of the relation between accounting information and cost of equity capital. Finally, Section 6 provides conclusions.

2. Data and Accruals Quality

2.1 Measuring Accruals Quality

The accounting literature has proposed a number of methods to measure accounting information quality. Following FLOS, we use the accruals quality measure developed by Dechow and Dichev (2002) (hereafter DD) as our main measure of accounting information quality. In the DD model, accruals quality is measured by the extent to which working capital accruals map into operating cash flow realizations. In DD's approach, working capital accruals are regressed on cash from operation in the current period, prior period, and future period. The unexplained portion of the variation in working capital accruals is an inverse measure of accruals quality (a greater unexplained portion implies poorer information quality). McNichos (2002) argues that the change in sales revenue and PPE (property, plant, and equipment) are important in forming an expectation about current accruals over and above the effects of operating cash flows. We, hence, use the augmented DD's approach, which is also used by FLOS, by regressing total current accruals on operating cash flows in the current period, prior period and future period and change in sales revenue and PPE. The model is:[3]

$$TCA_{j,t} = \phi_{0,j} + \phi_{1,j}CFO_{j,t-1} + \phi_{2,j}CFO_{j,t} + \phi_{3,j}CFO_{j,t+1} + \phi_{4,j}\Delta Rev_{j,t} + \phi_{5,j}PPE_{j,t} + \nu_{j,t}, \quad (1)$$

where $TCA_{j,t}$ = total current accruals (i.e., the total working capital accruals) of firm *j* in year *t*, calculated as $\Delta CA_{jt} - \Delta CL_{jt} - \Delta Cash_{jt} + \Delta STDEBT_{jt}$,

CFO_{jt} = cash flow from operations, calculated as $NIBE_{j,t} - TA_{j,t}$,

ΔRev_{jt} = change in revenues between year *t*-1 and *t*,

PPE_{jt} = gross value of property, plant and equipment (PPE),

$NIBE_{j,t}$ = net income before extraordinary items,

TA_{jt} = total accruals, calculated as

$$\Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STDEBT_{j,t} - DEPN_{j,t},$$

ΔCA_{jt} = change in current assets between year *t*-1 and *t*,

ΔCL_{jt} = change in current liabilities between year *t*-1 and *t*,

$\Delta Cash_{jt}$ = change in cash between year *t*-1 and *t*,

$\Delta STDEBT_{jt}$ = change in debt in current liabilities between year *t*-1 and *t*,

$DEPN_{jt}$ = depreciation and amortization.

The cross-sectional regression of equation (1) yields firm- and year-specific residuals, $\nu_{j,t}$, for each of Kiss-Value industry group's classification with at least 20 firms in each year *t*. The standard deviation of firm *j*'s residuals over year *t*-4 through *t* is used as our metric of accruals quality (AQ). A greater value of AQ indicates that the mapping of accruals to cash flows is more volatile and in turn suggests a potential inconsistency of the accounting policy. Therefore, a firm with a greater (smaller) AQ value is associated with a lower (higher) quality of accounting information and hence is expected to have a higher (lower) cost of equity capital, because investors could face more (less) likely sudden unexpected accounting information regarding firm's performance.

In fact, the cross-sectional regression of equation (1) does not distinguish among possible sources of risk related with accounting information quality. This model does not forecast the difference between the accounting information quality caused from the innate characteristics and the discretionary characteristics. That is, the innate accruals quality is driven by the features of firm's business model and operating circumstances, while the discretionary accruals quality results from accounting choices and managerial decisions.

[3] All of the above variables are scaled by the average total assets.

Guay et al.'s (1996) argue that the discretionary accruals quality include different subcomponents. Reflecting management's attempts to increase the ability of earnings in a stable way could reduce accounting information risk. Managers' discretionary attempts to improve the variability of earnings and to reduce information asymmetry could reduce the information risk premium demanded by investors. We expect, therefore, that the discretionary accruals quality affects the cost of capital in a smaller amount than does the innate accruals quality.

In order to decompose the total accruals quality into the discretionary and innate components as FLOS did. Five variables that affect firm's innate characteristics are chosen. They are firm size, the standard deviation of cash flow from operations, the standard deviation of sales revenues, the length of operating cycle, and the incidence of negative earnings realizations. According to FLOS, these variables capture economic fundamentals which drive the innate accruals quality. We estimate year by year the following cross-sectional regression of the AQ on these five innate factors in order to separates the innate and discretionary components from the total accruals quality:

$$AQ_{j,t}=\beta_0 +\beta_1 SIZE_{j,t} + \beta_2\sigma(CFO)_{j,t}+\beta_3\sigma(Sales)_{j,t}+\beta_4 OpCycle_{j,t}+\beta_5 NegEarn_{j,t}+v_{j,t} \qquad (2)$$

where $SIZE_{j,t}$ = firm size, the log of total assets,

$\sigma(CFO)_{j,t}$ = the standard deviation of cash flows from operations, measured over the previous five years,

$\sigma(Sales)_{j,t}$ = the standard deviation of sales revenues, measured over the previous five years,

$OpCycle_{j,t}$= the length of operation cycle, measured as log of the sum of days accounts receivable and days inventory,

$NegEarn_{j,t}$ = the incidence of negative earnings realization, measured by the number of years out of the last five with negative reported income before extraordinary items.

The predicted value from the cross-sectional regression (2) is regarded as the estimate of firm j's innate portion in year *t*, $IAQ_{j,t}$. The residuals is regarded as the estimate of firm j's discretionary component in year *t*, $DAQ_{j,t}$.

2.2 Summary of the Data

Accounting data are obtained from Kis-Value dataset, and monthly stock returns are from KSRI dataset. We require firms available for at least seven years of accounting data and industry groups to have at least 20 firms in a certain year. Kis-Value dataset industry group classification is used.[4] All KSE and KOSDAQ firms are included in the sample. Assuming that accounting information is available to the public in three months, a firm's AQ in year *t* is matched with returns from April of year t through March of year *t*+1. Therefore, AQ is treated as missing if all returns over April of year *t* through March of year *t*+1 are not available. Then, the sample consists of 98,741 firm-year observations of AQ available for the 10 years from 1996 to 2006.

Panel A of Table 1 presents the summary statistics of the accruals quality (AQ), discretionary accruals quality (DAQ), and innate accruals quality (IAQ). For AQ, we report a mean of 0.146, a median of 0.089, and standard deviation of 0.594. Compared to FLOS's, the mean and median of AQ are larger in Korea and than in the U.S. FLOS report a mean, and median, and standard deviation of AQ in the U.S. are 0.0442 and 0.0313, and 0.0119, respectively. This means that accounting information quality in Korea would be lower than in the U.S. Panel B of Table 1 shows the correlation coefficients among AQ, IAQ, and DAQ. The correlation coefficient between DAQ and AQ is 0.019, the correlation coefficient between IAQ and AQ is 0.023. Panel C shows the number of observations of AQ, DAQ, and IAQ in each year.

3. Portfolio Construction and the Characteristics of AQ-sorted Portfolios

By assuming that it takes three months for investors to fully digest accounting information after released, at the end of March in year *t*, we assign firms into one of ten decile portfolios according to their AQ values in year *t*-1. Firms are maintained in the same portfolio from April of year *t* to March of year *t*+1. Portfolio returns are then computed with equal weights. The sample period of computing portfolio returns is from January 1996 through December 2006. Portfolio 1 (Portfolio 10) contains firms having the smallest (largest) AQ values. Hence, Portfolio 1 (portfolio 10) consists of the best (worst) accounting information quality.

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[4] Most articles about accruals quality use Fama and French's (1997) 48 industry group classification.

Before investigating if AQ is priced into stock returns, it would be necessary to examine whether AQ is related to firm's fundamental risk. In order to do this, we select some financial and accounting variables which could have an influence on the uncertainty of future cash flows of firms and the degree of risk. Table 2 presents the average values of some these variables across AQ-sorted ten decile portfolios. Note that the average values on Table 2 are computed based on the information after the portfolio formation; that is, these indicate looking-ahead information. The reason that we use looking-ahead information is that we need to see that firms with large AQ value in a year actually turn out risky afterwards.

Based on the average values of the variables related with profitability (i.e., EPS, CFO, earnings scaled by average total assets, earnings excluding negative earnings, the percentage of negative earnings, and the frequency of negative earnings), we find in Table 2 that firms with poorer information quality tend to have smaller cash flows, lower earnings power, greater frequency of negative earnings, and greater variability of earnings. As for growth opportunity measures, we consider the R&D ratio (R&D expenses divided by the total asset), dividend payout ratio, and growth rate of capital investments. Unlikely the profitability measures, the proxies for growth opportunity do not show a monotonic relation with AQ. As for the variability of cash flows, we use the standard deviations of sales and CFO. The standard deviation of sales slightly monotonically increases with AQ. However, this monotonic relation seems weak. The standard deviation of CFO shows an apparently monotonic positive relation with AQ. In sum, Table 2 suggests that firms with poorer accounting information quality tend to have *future* accounting measures pointing toward greater risk.

Table 3 shows the averages of monthly returns, standard deviations of returns, AQ values, market beta, firm size, and book-to-market ratio. If AQ is a priced factor, we expect that portfolios with higher (lower) AQ would have greater (lower) average returns and standard deviations, since portfolios with higher AQ are of poorer accounting information quality and more risky. However, average returns do not increase monotonically with the value of AQ. Portfolio 1 (firms of the best accounting information quality) has earned a return of 2.48 percent, and portfolio 10 (firms of the worst accounting information quality) has earned a return of 2.59 percent. The difference in average returns between these two extreme portfolios is almost flat. Moreover, the average returns do not show any monotonic trend across the AQ portfolios. These results are quite different from those of the U.S that show an apparent monotonic trend in average returns across AQ. Our results, therefore, are not consistent with the AQ pricing story. When we sort stock returns based on the innate AQ and discretionary AQ, we still have the similar results.

The relation between AQ and the popular proxies of risk such as firm size and book-to-market ratio measures also indicates that AQ could be a proxy for a risk. Table 3 shows that firms with greater AQ tend to be smaller in market capitalization and to have higher book-to-market ratio. Despite the results in Tables 2 and 3 consistently showing that AQ is related with several risk measures, we fail to find evidence from Table 3 that AQ does have any monotonic relation with average stock returns. Moreover, if risk related with AQ is a priced factor in the CAPM context, market betas should show a positive association with AQ. Table 3 shows, however, that market betas have no relation with AQ. This indicates that risk related with accounting information quality is not systematically priced in stock returns. In other words, the portion to the extent that AQ is related with the proxies for firm's fundamental risk might be a diversifiable and idiosyncratic risk, not a systematic risk in Korea. In addition, this evidence also means that AQ does not affect the cost of equity capital in the Korean markets.

4. Accounting Information Quality and the Cost of Capital

4.1 Accounting Information Quality and the Cost of Debt

We provided in the previous section some evidence that accounting information quality does not affect the cost of equity capital. In this section, we examine if there is a relation between accounting information quality and the cost of debt. AQ, innate AQ, and discretionary AQ are used as a proxy for accounting information quality. The ratio of firm's interest expense in year *t*+1 to the average interest-bearing debt outstanding during the period from year *t* to year *t*+1 is a proxy for the cost of debt. In order to estimate a pure relation between accounting information and the (realized) cost of debt, we need to control for other factors affecting the cost of debt. According to Kaplan and Urwitz (1979) and Palepu et al. (2000), these factors are financial leverage, firm size, return on assets, interest coverage, and earnings volatility. Therefore, we estimate the following pooled regression model:

$$\begin{aligned} CostDebt_{j,t} = \theta_0 + \theta_1 Leverage_{j,t} + \theta_2 Size_{j,t} + \theta_3 ROA_{j,t} + \theta_4 IntCov_{j,t} \\ + \theta_5 \sigma(NIBE)_{j,t} + \theta_6 AQ_{j,t} + \varsigma_{j,t} \end{aligned} \quad (3)$$

where $CostDebt_{j,t}$ = interest expenses in year *t*+1 to the average interest-bearing debt outstanding during the period from year *t* to year *t*+1

$Leverage_{j,t}$ = ratio of interest-bearing debt to total assets in year t,

$Size_{j,t}$ = log of total assets in year t,

$ROA_{j,t}$ = return on assets in year t,

$IntCov_{j,t}$ = ratio of operating income to interest expense in year t,

$\sigma(NIBE)_{j,t}$ = standard deviation of net income before extraordinary items (NIBE), scaled by average assets, over the rolling prior 10-year period. We require at least five observations of NIBE.

If lenders recognize that firms with lower accruals quality is riskier than firms with higher accruals quality, thereby, lenders would require higher returns from firms with lower accruals information quality. We expect, therefore, there will be a positive relation between AQ and the cost of debt. We also expect that the coefficients on leverage and earnings variability (σ(NIBE)) are positive, while the coefficients on firm size, ROA, and interest coverage (IntCov) are negative.

Table 4 presents the above pooled regression results of the cost of debt on AQ (in Panel A), innate AQ (in Panel B), and discretionary AQ (in Panel C). The first five rows in Panel A show the coefficient estimates and *t*-statistics for the five control variables. As expected, leverage is significantly positively correlated with *CostDebt* (at a one percent level), and firm size, ROA, and interest coverage are significantly negatively correlated with *CostDebt* (at a one percent level). Earnings variability (σ(NIBE)) is unexpectedly negatively correlated with *CostDebt*. However, the coefficient estimate on AQ is statistically insignificant. That is, it is 0.001, with t-statistic of 0.85. When innate AQ or discretionary AQ is used, the results are similar. That is, the coefficient estimates on innate AQ and on discretionary AQ are 0.00007 (with t-statistic of 0.67) and -0.00007 (with t-statistic of -0.66), respectively, after controlling for the five factors. In Panels B and C, all the control variables, except for firm size, are statistically significantly correlated with CostDebt, with expected sign on the coefficient. Unlike in the U.S, therefore, we conclude that accounting information quality is not related with the cost of debt in Korea.

4.2 Accounting Information Quality and Costs of Equity Capital

Liu et al. (2002) suggest a valuation model by linking a stock price to an earnings multiple. Dechow and Dichev (2002) also place a stock price on a dollar of earnings. In fact, the price-earnings ratio indicates the dollar amount paid by investors to a firm for a dollar of earnings. The higher the price-earnings ratio, the lower the cost of equity to the firm. Regarding the price-earnings ratio as an inverse indicator of the cost of equity, we examine if poorer accruals quality indicates lower price-earnings ratio. Concerning with the effects of small values of earnings in the denominator, we use earnings-price (EP) ratios, which is an inverse of price-earnings ratio. According to Alford (1992) that industry membership works well for selecting firms that are comparable based on risk and growth, we use industry-adjusted EP ratios. We, therefore, test whether accruals quality is *positively* related with industry-adjusted earnings price ratios.

Following FLOS (2005), we first calculate the median earnings-price ratio of firms in year *t* in each of Kis-Value industry classifications as an industry-adjusted EP ratio.[5] We calculate firm j's industry-adjusted EP ratio, $IndEP_{jt}$, as the difference between its EP ratio and the median industry EP ratio in year *t*. On order to test if accruals quality is related with industry-adjusted EP ratios after controlling for growth, leverage, beta, and firm size, we estimate the following pooled regression model:

$$IndEP_{j,t} = \varphi_0 + \varphi_1 Growth_{j,t} + \varphi_2 Leverage_{j,t} + \varphi_3 Beta_{j,t} + \varphi_4 Size_{j,t} + \varphi_5 AQ_{j,t} + \varsigma_{j,t} \quad (4)$$

where $Growth_{j,t}$ = the log of one plus the firm's growth rate in the book value of equity over the past 5 years,

$Leverage_{j,t}$ = the ratio of interest-bearing debt to total assets in year t,

$Beta_{j,t}$ = the 5-year rolling market beta estimated by using the past 5 years of data (at least 18 monthly returns used),

$Size_{j,t}$ = the log of firm j 's total assets in year t.

The estimated coefficient on $AQ_{j,t}$ in equation (4) captures whether accounting information quality affects to the cost of equity that is incremental to the control factors. If investors perceive firms with poorer AQ as riskier than firms with better AQ, there will be a positive relation between *IndEP* and AQ. If investors apply lower multiples to poorer-quality accruals, we expect the earnings associated with such accruals to have larger *IndEP* values. That is, the firms with poorer accruals quality have the higher *IndEP*. We also expect that the coefficients on beta and leverage are positive, while the coefficients on growth and firm size are negative.

[5] We require there exist at least five firms in each industry in a specific year to obtain the median industry earnings-price ratio.

Table 5 presents the above pooled regression results of the industry-adjusted EP ratio on AQ (in Panel A), innate AQ (in Panel B), and discretionary AQ (in Panel C). The first four rows in Panel A show the coefficient estimates and *t*-statistics for the control variables. As expected, size is significantly negatively correlated with *IndEP* (at a one percent level). This is consistent with the fact that smaller firms are riskier rather than larger firms. The coefficient estimates on the other control variables are insignificant. After controlling for the factors related to earnings-price ratios, we find that AQ is not related to *IndEP*. The coefficient estimate on AQ is statistically insignificant; it is -0.159 with t-statistic of -0.17. We also find that the innate and discretionary AQ are not related to *IndEP*. Panel B shows that the coefficient estimate on the innate AQ (IAQ) is 0.001, with t-statistic of 0.10. Panel C also shows that the coefficient estimate on the discretionary AQ (IAQ) is -0.001, with t-statistic of -0.09. Unlike in the U.S, therefore, we again conclude that accounting information quality does not affect the cost of equity in Korea.

5. Another Evidence That AQ does not matter on the Cost of Equity Capital

In this section, we provide another perspective in examining whether accounting information quality affects the cost of equity capital by examining the risk premia associated with commonly-used risk factors over a measure of accounting information quality (i.e., AQ). If accounting information quality affects the cost of equity and it consists of the risk premia corresponding to some risk factors, then the risk premia should be affected by the degree of accounting information quality. Literature shows that the risk premia related with size and book-to-market are a strong component of the cost of equity capital (see Fama and French, 1993). So, if AQ does matter on the cost of equity capital, the risk premia of the well-known risk factors such as size and book-to-market should be affected according to the magnitude of AQ. Besides size and book-to-market, we consider Jegadeesh and Titman's (1993) price momentum factor as another component of the cost of equity.

In order to examine the association between AQ and the risk premia related to the above risk factors, we form five quintile AQ portfolios which are constructed in the exactly same way as used in Table 1. Then, within each AQ-sorted quintile portfolio, we re-allocate the firms into one of five quintile portfolios according to the magnitude of the market equity value (ME), book-to-market (BM) ratio, or one-year price momentum (MNT).

Table 6 shows how the risk premia related with firm size, book-to-market, and momentum are changed according to the magnitude of AQ. Panel A of Table 6 shows that the difference in average returns between the smallest size portfolio (ME1) and the largest size portfolio (ME5) does not monotonically change with AQ. Note that the difference is the return on a zero-investment arbitrage portfolio, and it indicates the conditional risk premium related to firm size on a given degree of accounting information quality. If AQ affects the cost of equity, the risk premium related with size should show a monotonic relation with the degree of AQ. Specifically, the monthly risk premia related with size (ME5-ME1) are 4.17 percent, 5.15 percent, 3.41 percent, 4.37 percent, and 4.23 percent for the best AQ portfolio (AQ1) through the poorest AQ portfolio (AQ5), respectively. A similar phenomenon about an association between AQ and the risk premium related to book-to-market is also found in Panel B. That is, the difference in average returns between the lowest BM portfolio (BM1) and the highest BM portfolio (BM5) also does not monotonically change with AQ. Specifically, the monthly risk premia related with book-to-market (BM5-BM1) are 2.89 percent, 2.43 percent, 4.67 percent, 4.36 percent, and 4.31 percent for the best AQ portfolio (AQ1) through the poorest AQ portfolio (AQ5), respectively. Panel C shows that the monthly risk premia related with price momentum (MNT5-MNT1) also do not have a monotonic relation with AQ. In sum, we argue that as accounting information quality becomes poorer, investors would not require a greater risk premium associated with the well-know risk factor such as firm size, book-to-market, and price momentum.

6. Conclusions

There has been a debate as to whether accounting information quality priced on asset returns and systematically affects the cost of capital of firms in the world market. In this paper, we examine whether there is a relationship between accounting information quality proxied by accruals quality in the Korean markets, and whether it does affect the cost of capital. Although accruals quality is linked with some variables representing the uncertainty of future cash flows and thus it could be a good proxy for a risk, we find no evidence that this risk is systematically priced in stock returns and it does affect the cost of capital in Korea, unlike in the U.S.

Specifically, after controlling for the factors affecting the cost of debt and the cost of equity, we find that the proxy variable for accounting information quality has no significant relation with the cost of debt and the cost of equity. In particular, there is no relation between accruals quality and the market beta which is another good proxy for the cost of equity in the CAPM context. Furthermore, there is a flat relation between average stock returns and accruals quality. These results are quite different from those of the U.S that show an apparent monotonic trend in average returns across AQ. Our results, therefore, are not consistent with the AQ pricing story in Korea.

We also provide another perspective in examining whether accounting information quality affects the cost of equity capital by examining the risk premia associated with commonly-used risk factors over a measure of accounting information quality. That is, if accounting information quality affects the cost of equity, as accounting information quality becomes poorer, investors would require a greater risk premium associated with the well-know risk factor such as firm size, book-to-market, and price momentum. However, we find no evidence supporting this. That is, as accounting information quality becomes poorer, a risk premium associated with the risk factor is not increased.

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Table 1. Summary Statistics of the Accounting Quality Measures

Using augmented Dechow and Dichev's (2002) method, we calculate the accruals quality (AQ), the discretionary accruals quality (DAQ), the innate accruals quality (IAQ). Some basic statistics of AQ, DAQ, and IAQ are summarized. The sample period is from January1996 through December 2006.

Panel A: Summary Statistics

Accounting Quality measure	Number of observations	10th percentile	Lower quartile	Mean	Median	Upper quartile	90th percentile	Standard deviation
AQ	98,741	0.031	0.055	0.146	0.089	0.140	0.233	0.594
DAQ	24,992	-0.244	-0.045	0.2483	0.000	0.041	0.178	4.636
IAQ	24,992	0.023	0.064	-0.115	0.092	0.155	0.480	4.637

Panel B : Correlation Matrix

	AQ	DAQ	IAQ
AQ	1.000		
DAQ	0.019	1.000	
IAQ	0.023	-0.999	1.000

Panel C: Number of Observations (or Firms) of AQ, DAQ, and IAQ in Each Year

Year	1996	1997	1998	1999	2000	2001	2002	2003
AQ	1,800	5,929	9,237	9,722	9,813	9,722	10,504	10,576
DAQ				650	698	696	672	4,168
IAQ				650	698	696	672	4,168

Year	2004	2005	2006
AQ	10,226	10,274	10,916
DAQ	5,228	6,573	6,307
IAQ	5,228	6,573	6,307

Table 2. Characteristics of AQ-Ranked Decile Portfolios

Firms that were listed on the KSE and KOSDAQ with available accruals quality (AQ) measures are assigned into one of ten decile portfolios at the end of March of each year according to the magnitude of their AQ at the end of last year. Portfolio 1 (10) contains firms with the smallest (largest) AQ. The composition of the portfolio is maintained from April of the year through March of the following year. The cost of debt is estimated as interest expenses divided by interest bearing debt. The percentage of negative Earnings is the percentage of negative earnings over the past 10 years. CFO is the cash flow from operation. R&D ratio is the R&D expenses divided by the total asset. Growth of Capital Investment is estimated as the growth rate of capital investment cash flows. Earnings, sales and CFO are scaled by the average total asset of the year. The sample period is from January 1996 through December 2006.

AQ Portfolio	EPS	CFO	Earnings	Ave Earnings excl. Negative Earnings	Negative Earnings (%)	Freq. Negative Earnings	ROA
1	2724.381	0.060	0.003	0.056	0.055	0.151	0.023
2	2198.423	0.058	0.008	0.052	0.131	0.196	0.017
3	2282.194	0.055	0.006	0.057	0.138	0.187	0.001
4	1556.303	0.062	0.002	0.051	0.190	0.186	0.021
5	1459.068	0.049	0.012	0.053	0.110	0.192	0.016
6	1784.352	0.054	0.004	0.054	0.222	0.249	0.002
7	1224.547	0.052	-0.029	0.060	0.269	0.232	0.003
8	528.172	0.035	-0.013	0.082	0.225	0.294	-0.034
9	1464.837	0.020	-0.049	0.067	0.295	0.323	0.001
10	867.222	0.020	-0.051	0.094	0.339	0.363	-0.018

AQ Portfolio	R&D	Dividend Payout Ratio	Growth Capital Invest -ment	Standard deviation of sales	Standard deviation of CFO	D/A
1	0.007	30.794	-0.058	0.210	0.050	0.533
2	0.006	31.877	0.220	0.205	0.053	0.537
3	0.006	33.337	0.23	0.224	0.059	0.572
4	0.006	33.860	-1.577	0.204	0.057	0.553
5	0.005	33.860	-1.533	0.267	0.058	0.546
6	0.007	32.299	1.158	0.290	0.063	0.576
7	0.006	34.469	2.790	0.261	0.067	0.574
8	0.006	33.485	-0.432	0.346	0.073	0.596
9	0.007	32.813	-1.178	0.274	0.092	0.597
10	0.005	33.185	-0.522	0.334	0.128	0.657

Table 3. Average Monthly Returns on the Accrual Quality-Ranked Decile Portfolios

Firms that were listed on the KSE and KOSDAQ with available accruals quality (AQ) measures are assigned into one of ten decile portfolios at the end of March of each year according to the magnitude of their AQ at the end of last year. Portfolio 1 (10) contains firms with the smallest (largest) AQ. The composition of the portfolio is maintained from April of the year through March of the following year. The sample period is from January 1996 through December 2006.

AQ Portfolio	Ave return (%)	Standard deviation (%)	Beta	AQ	Book-to-Market ratio	Firm size (bil.won)	Price (won)	# Firm
1	2.48	7.59	0.907	0.0222	0.565	412.073	19042	61.4
2	3.03	8.55	1.014	0.0405	0.659	495.784	13013	67.0
3	2.81	8.43	0.991	0.0534	0.878	361.016	17235	64.0
4	3.64	9.59	0.973	0.660	0.685	404.151	10779	64.6
5	2.57	8.75	0.983	0.0783	0.953	293.766	10156	64.4
6	3.02	6.11	0.920	0.0918	0.846	199.181	7993	64.5
7	2.81	8.25	0.890	0.1092	0.854	298.976	8109	64.8
8	3.05	8.32	0.936	0.1347	0.863	113.471	6555	64.6
9	2.50	5.86	0.909	0.1828	1.013	104.470	6414	62.5
10	2.59	9.51	0.737	0.6256	1.455	93.398	4037	65.2

Table 4. Relations between the Cost of Debt and Accruals Quality

This table reports the estimation results of a pooled regression model of the cost of debt on accruals quality (AQ) and the five controlling variables. The total AQ, innate AQ (IAQ), and discretionary AQ (DAQ) are used for accruals quality variable in Panels A, B, and C, respectively. $Leverage_{j,t}$ is firm j 's ratio of interest-bearing debt to total assets in year t, $Size_{j,t}$ is log of firm j 's total assets in year t, $ROA_{j,t}$ is firm j 's return on assets in year t, $IntCov_{j,t}$ is firm j 's ratio of operating income to interest expenses in year t, $\sigma(NIBE)_{j,t}$ is the standard deviation of firm j 's net incomes before extraordinary items (NIBE) scaled by average assets, which is computed by using at least five observations of NIBE over the rolling prior 10-year period. The samples are used from 1996 through 2006.

Independent variable	Predicted sign	Coefficient estimate	*t*-value	*Adj.* R^2
Panel A: Total AQ is used for accruals quality variable				
Leverage	+	0.004	3.40	0.177
Size	-	-0.003	-6.61	
ROA	-	-0.031	-5.52	
IntCov	-	-0.003	-15.57	
σ(NIBE)	+	-0.033	-2.42	
AQ	+	0.001	0.85	
Panel B: Innate AQ is used for accruals quality variable				
Leverage	+	0.06925	8.16	0.311
Size	-	-0.00042	-0.60	
ROA	-	-0.02653	-2.00	
IntCov	-	-0.00068	-3.67	
σ(NIBE)	+	0.06942	3.93	
IAQ	+	0.00007	0.67	
Panel C: Discretionary AQ is used for accruals quality variable				
Leverage	+	0.06925	8.16	0.311
Size	-	-0.00042	-0.60	
ROA	-	-0.02652	-2.00	
IntCov	-	-0.00069	-3.67	
σ(NIBE)	+	0.06944	3.93	
DAQ	+	-0.00007	-0.66	

Table 5. The Relations between Industry-adjusted EP ratios and Accruals Quality

This table reports the estimation results of a pooled regression model of the industry-adjusted earnings–price ratio on accruals quality (AQ) and the five controlling variables. The total AQ, innate AQ (IAQ), and discretionary AQ (DAQ) are used for accruals quality variable in Panels A, B, and C, respectively. $Growth_{j,t}$ is the log of one plus the firm's growth rate in book value of equity over the past 5 years; $Beta_{j,t}$ is the five-year rolling pre-estimated beta obtained from firm-specific market model estimations using the past 5 years of data, at least 18 monthly returns; $Leverage_{j,t}$ is firm j 's ratio of interest-bearing debt to total assets in year t; and $Size_{j,t}$ is log of firm j 's total assets in year t.. The samples are used from 1996 through 2006.

Independent Variable	Predicted sign	Coefficient estimate	*t*-value	*Adj*. R^2
Panel A: Total AQ is used for accruals quality variable				
Growth	-	0.129	0.58	0.003
Beta	+	0.045	0.45	
Leverage	+	0.319	1.33	
Size	-	-0.359	-2.55	
AQ	+	-0.159	-0.17	
Panel B: Innate AQ is used for accruals quality variable				
Growth	-	0.192	0.94	0.003
Beta	+	-0.006	-0.04	
Leverage	+	3.346	3.47	
Size	-	-0.025	-0.33	
IAQ	+	0.001	0.10	
Panel C: Discretionary AQ is used for accruals quality variable				
Growth	-	0.192	0.94	0.003
Beta	+	-0.006	-0.04	
Leverage	+	3.340	3.48	
Size	-	-0.026	-0.34	
DAQ	+	-0.001	-0.09	

Table 6. Accounting Quality (AQ), Size, Book-to-Market Ratio and Momentum

Firms listed on KSE and KOSDAQ are assigned into one of five quintile portfolios at the end of March of each year according to the magnitude of their accruals quality (AQ) at the end of last year. Portfolio 1 (5) contains firms with the smallest (largest) AQ. Then, within each AQ portfolio, firms are re-allocated into one of five quintile portfolios according to the magnitude of market equity value (ME), book-to-market (BM) ratio, or one-year price momentum (MNT). "(1)-(5)" or "(5)-(1)" indicates the difference in average returns between Portfolio 1 and Portfolio 5 within each AQ portfolio. The sample period covers from January 1996 through December 2006.

Panel A: Average Monthly Returns(%) of AQ X Size(Me) Ranked Portfolios

	ME1	ME2	ME3	ME4	ME5	(1)-(5)	Overall
AQ1	5.92	1.73	1.43	1.88	1.74	4.17	2.35
AQ2	7.00	2.44	1.92	1.31	1.84	5.15	2.87
AQ3	5.01	3.63	1.36	1.23	1.60	3.41	2.53
AQ4	5.64	2.32	2.12	0.65	1.27	4.37	2.35
AQ5	5.35	1.93	1.84	0.84	1.12	4.23	2.11
Overall	5.67	2.45	1.71	1.18	1.52	-4.15	

	BM1	BM2	BM3	BM4	BM5	(5)-(1)	Overall
AQ1	1.37	1.55	1.40	3.29	4.26	2.89	2.35
AQ2	1.11	1.37	2.61	5.51	3.55	2.43	2.87
AQ3	0.35	1.81	2.48	3.00	5.02	4.67	2.53
AQ4	0.01	0.71	2.62	4.01	4.37	4.36	2.35
AQ5	0.32	1.41	1.24	3.25	4.63	4.31	2.11
Overall	0.63	1.38	2.08	3.79	4.32	3.69	

	MNT1	MNT2	MNT3	MNT4	MNT5	(5)-(1)	Overall
AQ1	0.17	0.34	0.98	0.75	0.09	-0.08	0.46
AQ2	2.11	0.44	0.20	0.85	0.09	-2.02	0.76
AQ3	1.75	1.87	1.38	0.77	0.30	-1.46	1.24
AQ4	3.15	0.54	1.23	-0.25	-0.66	-3.82	0.82
AQ5	2.46	0.86	0.17	1.43	-1.27	-3.73	0.71
Overall	1.94	0.84	0.79	0.71	-0.28	-2.22	