



Measuring Earnings Quality Over Time

Yohan An*

Department of Finance & Accounting, Tongmyong University, Republic of Korea. *Email: accahn@tu.ac.kr

ABSTRACT

The purpose of this paper is to analyze earnings quality over the twelve years. We measure earnings quality as two types of dimensions: (1) Decision usefulness and (2) stewardship (or accountability) based on the conceptual framework of the International Financial Reporting Standards. This paper investigates earnings quality of listed firms on the Korean stock exchange using a sample of 9584 firm-year observations over the period 1995-2006. Earnings quality as decision usefulness is measured as persistence and value-relevance, while earnings quality as stewardship (or accountability) is measured as conservatism and accruals quality. This study finds earnings quality of Korean firms is relatively lower than that of developed countries across three earnings quality dimensions except for conservatism. Thus, it is likely that Korean firms engage in earnings management in the presence of economic incentives, thereby reducing earnings quality.

Keywords: Earnings Quality, Decision Usefulness, Stewardship

JEL Classifications: G30, M4

1. INTRODUCTION

The purpose of this paper is to measure earnings quality of listed on the Korean stock exchange (KSE) using a sample of 9584 firm-year observations from 1995 to 2006. As a proxy of financial reporting quality, earnings quality is measured as two types of approaches: Decision usefulness and stewardship (or accountability) based on the conceptual framework of the International Financial Reporting Standards (IFRS). From the standpoint of as a proxy of financial reporting quality, earnings quality is associated with the relevance of the financial information and measured as earnings persistence and value-relevance, while earnings quality in the view of stewardship (or accountability) is related with reliability of financial information and measured as conservatism and accruals quality. Earnings quality is the most primary proxy of financial statements and the most comprehensive measure for financial reporting quality (Lev 1989), but not exclusively defined (Balsam et al., 2003).

This study is expect to have several contributes. First, this study provides good coverage of recognized earnings quality indicators by examining various measures of earnings quality. Second, the measure of earnings quality over time is important for regulators because analysis of financial statements is meaningful indicator

for economic efficiency of country. Thus, this study provides implication for regulator of accounting standard setting. Finally, a time-series analysis of earnings quality plays an important role to various stakeholders since earnings quality means the firm's accounting performance and is useful measure for assessing firm value (Dechow and Schrand, 2004).

This paper begins with this introduction section, and then section 2 discusses previous literatures on earnings quality. Section 3 discusses the methodology used in the paper. In section 4, we reports empirical results. Finally section 5 provides conclusions for the paper.

2. LITERATURE REVIEW

The definition of earnings quality is various by researchers. Entwistle and Phillips (2003) suggest that earnings quality should be correspond with the core purpose of financial reporting providing relevance and reliability to financial statement users. Dechow (1994) insists that earnings are very important for a large variety of stakeholders because of providing information of firm performance. Investors and managers use earnings as one of the main guides to identify and evaluate investment opportunities (Bushman and Smith 2003). In addition, investors

use earnings to extract value-relevant information from pattern of earnings (Francis et al., 2004). Earnings quality is also used for contracting purposes by current and future investors (Schipper and Vincent, 2003). Dechow and Dichev (2002) suggest that earnings are one of the most important measures to assess firm's future cash flows. To summarize, financial statements can be regarded as being high quality when reported earnings accurately reflect underlying economic events and conditions as well as enable financial statements users to make better decisions. In addition, high earnings quality can be achieved if earnings reflect firm's transparency and provide users with useful accounting information to evaluate the firm's performance.

In the view of decision usefulness, the purpose of financial statements should provide useful information to users in making economic decision, causing difference to their decisions. Decision usefulness of perspective is related to persistence and value-relevance (Schipper and Vincent, 2003; Jonas and Blanchet, 2000). Highly persistent earnings mean more permanent and less transitory so that financial statement users recognize them as high earnings quality. Francis and Schipper (1996) and Hung (2001) define the value-relevance of accounting information as the ability of financial statements to summarize information that affects firm value as well as the captures of the relevance of earnings (Barth et al., 2001; Schipper and Vincent, 2003). Thus, persistence and value-relevance can be good proxy of earnings quality reflecting the concept of decision usefulness.

The standpoint of stewardship (or accountability) emphasizes financial information transparency, the faithfulness and objectivity. Rezaee (2002) and Ball et al. (2000; 2003) propose that financial information should be fully and fairly disclosed and should not mislead or confuse financial statement users. In summary, the role of financial reporting under the view of stewardship (or accountability) is to monitor management by mitigating information asymmetry between manager and stakeholders.

Earnings quality based on the stewardship (or accountability) can be measured by conservatism and accruals quality. Determinant criteria of financial reporting quality are defined as a degree of aggressiveness or conservatism of accounting principles (The SEC Recommendation No.8). Conservatism captures financial statement transparency since conservatism constrains managerial opportunistic behavior and offsets managerial biases with its financial information asymmetry (Ball et al., 2000; 2003; Watts 2003a). Accruals quality is a good proxy of earnings quality (Schipper and Vincent, 2003) since accruals quality represents the faithfulness of financial reporting. Faithfulness of financial reporting is defined as that "to be reliable, information must represent faithfully the transactions and other events it either purports to represent or could reasonably be expected to represent." (The IASB Framework, paragraph 33). Consequently, conservatism and accruals quality can be proxy to measure of earnings quality under the concept of stewardship (or accountability).

3. MATERIALS AND METHODS

3.1. Sample

The sample in study consists of listed firms on the KSE. We collect data from OSIRIS database for the years 1995-2006. All financial institutions (e.g. commercial banks, insurance firms, security brokerage firms etc.) are excluded due to inconsistency of financial statement format. The final sample is a total of 9584 firm-years observations.

3.2. Measure of Earnings Quality

As discussed in literature review section, earnings quality is classified into two categories: (1) Decision usefulness and (2) stewardship (or accountability). In the view of decision usefulness, earnings quality is measured as persistence and value-relevance, while earnings quality under the stewardship (or accountability) is measured as conservatism and accruals quality.

3.2.1. Persistence

Persistence means how much of current earnings will persist into the future and continue from period to period. Following Boonlert-U-Thai et al. (2006) and Ali et al. (2007), persistence is measured as the slope-coefficient following equation:

$$\frac{\text{Earnings}_{i,t}}{\text{Total Asset}_{i,t-1}} = \alpha + \beta_1 \frac{\text{Earnings}_{i,t-1}}{\text{Total Asset}_{i,t-1}} + \varepsilon_{i,t} \quad (1)$$

Where for firm i and year t , $\text{Earnings}_{i,t}$ is net income before extraordinary items in current year; $\text{Earnings}_{i,t-1}$ is earnings before extraordinary items in previous year; $\varepsilon_{i,t}$ is the residuals.

Value of β_1 close to one indicates highly persistence earnings, while value of β_1 close to zero reflects highly transitory earnings. Financial information users recognize highly persistent earnings as sustainable, less transitory, and more stable (Richardson et al., 2003). Therefore, large (small) values of the slope-coefficient (β_1) correspond to more (less) persistence.

3.2.2. Value relevance

Following, Collins et al.'s (1997) and Ali and Hwang (2000), we measure value-relevance as the explanatory power of earnings and book value of equity for stock returns. Hence, following equation is employed to measure value-relevance.

$$P_{i,t} = \alpha_0 + \beta_1 BV_{i,t} + \beta_2 EPS_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where for firm i and year t , $P_{i,t}$ is the stock price at the end of year; $BV_{i,t}$ is the book value of stock at the end of year; $EPS_{i,t}$ is the earnings per share at the end of year; $\varepsilon_{i,t}$ is the residuals.

The value-relevance is the explanatory power of regression (R^2) from Equation (2). Large (small) R^2 corresponds to more (less) value-relevant earnings.

3.2.3. Conservatism

Ball and Shivakumar (2005) measure degree of conservatism as the relationship between accruals and negative cash flows over

the association between accruals and cash flows modifying Basu (1997). We measure conservatism using Ball and Shivakumar's (2005) model.

$$\frac{ACC_{i,t}}{TotalAssets_{i,t-1}} = \alpha_0 + \beta_1 \frac{NOCF_{i,t}}{TotalAssets_{i,t-1}} + \beta_2 \frac{OCF_{i,t}}{TotalAssets_{i,t-1}} + \beta_3 \frac{NOCF_{i,t}}{TotalAssets_{i,t-1}} * \frac{OCF_{i,t}}{TotalAssets_{i,t-1}} + \varepsilon_{i,t} \quad (3)$$

Where for firm i and year t , and $ACC_{i,t}$ is accruals; $NOCF_{i,t}$ is a dummy variable, which takes 1 if $OCF_{i,t}$ is negative, otherwise 0; OCF is operating cash flows; $\varepsilon_{i,t}$ is the residuals.

The degree of conservatism is the value of the incremental coefficient (β_3) from Equation (3). The larger (smaller) value of the incremental coefficient (β_3) is, the more (less) conservative earnings is.

3.2.4. Accruals quality

Dechow and Dichev (2002) and Mikhail et al.(2003) argue that earnings will be more representative of future cash flows when accruals contain lower estimation error. We employ the following Francis et al. (2005) model to measure accruals quality.

$$\frac{TCA_{i,t}}{TotalAssets_{i,t-1}} = \alpha + \beta_1 \frac{OCF_{i,t-1}}{TotalAssets_{i,t-1}} + \beta_2 \frac{OCF_{i,t}}{TotalAssets_{i,t-1}} + \beta_3 \frac{OCF_{i,t+1}}{TotalAssets_{i,t-1}} + \beta_4 \frac{\Delta REV_{i,t}}{TotalAssets_{i,t-1}} + \beta_5 \frac{PPE_{i,t}}{TotalAssets_{i,t-1}} + \varepsilon_{i,t} \quad (4)$$

Where, TCA is firm i 's total current accruals in current year; OCF is operating cash flow; ΔREV is change in operating revenue; PPE is firm i 's property, plant and equipment.

Following Srinidhi and Gul (2007), our measure of accruals quality is the absolute value of estimated residuals ($|\varepsilon_{i,t}|$) from Equation (4). Higher accruals quality is considered when accruals quickly convert into cash (Dechow and Dichev, 2002). Thus, in Equation (4), the residuals ($\varepsilon_{i,t}$) captures large uncertainty of accruals (the degree of accruals quality). Thus, the large (small) values of the absolute value of the firm-level residuals ($|\varepsilon_{i,t}|$) is, the poorer (better) accrual quality is.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

Descriptive statistics of our earnings quality proxies is presented in Table 1. For persistence, the mean (median) value of current earnings is 0.057 (0.038), while the mean (median) value of previous earnings is 0.052 (0.039), respectively. This result can be explained as that the association between current and previous earnings in Korean firms is stable but low. Descriptive statistics

of the variables used to test value-relevance are represented in Panel B of Table 2. The mean value of stock price, book values of stock and earnings per share (EPS) for the Korean firms have positive values. All positive values of three variables suggest that the most Korean firms are financially stable. For conservatism, the mean value of total accruals are negative (-0.058) in Panel C of Table 3. Since total accruals are calculated from net income, negative mean value of total accruals can be estimated as low net income of Korean firms, resulting from low management outcome. Panel D of Table 1 presents descriptive statistics of variables used in accruals quality. As similar to conservatism variables, the mean value of current accruals, previous, current and future operating cash flows is positive. In Panel D of Table 1, the degree of accruals quality (the absolute value of residuals) is 0.067 (mean) and 0.112 (median), respectively. Comparing with benchmark country, accruals quality of Korean firms is relatively lower than U.S. firms. According to Dechow and Dichev (2002), accruals quality of U.S. firms is mean (median) values of 0.028 (0.020) as well as Francis et al. (2004) inform mean (median) values of 0.026 (0.019).

4.2. Correlation

The correlation between current and previous earnings is 0.148 at 0.01 levels shown in the Panel A of Table 1 so that no high correlation exists. In Panel B of Table 2, book value and EPS have highly correlated to stock price as expected. This result implies that stock price of Korean firms is significantly reflected to book values and EPS. In the Panel C of Table 2, total accruals and operating cash flow are negatively correlated (-0.764) similar to previous study (Dechow 1994; Ball and Shivakumar, 2005). The interaction term with negative operating cash flow dummy variable and operating cash flow shows positive correlation with total accruals (0.124). Panel D of Table 4 provides the correlation among variables used in accruals quality. Similar to previous researches, previous, current and future operating cash flow are highly correlated, but not highly correlated with current accruals.

4.3. Empirical Results

Panel A of Table 3 provides the result of persistence for firm-years during the period 1995-2006. Persistence, measured as the slope-coefficient (β_1) from Equation (1) is 0.061 which is statistically significant at 0.01 levels. This result is highly close to zero which proposes that earnings of Korean firms are much less persistent and highly transitory. Hence, earnings quality as decision usefulness is significant low, thereby do not provide useful financial information to stakeholders.

The degree of value-relevance for firm-years from 1995 to 2006 from Equation (2) is presented to Panel B of Table 3. The degree of value-relevance is measured as the explanatory power of regression (R^2) from Equation (2) following Collins et al. (1997). As shown in Panel C, the association between book values and EPS are 0.534 and 0.502 and both are statically significant with stock price ($P < 0.01$), respectively. The degree of value-relevance (R^2) is 52% which means that book values and EPS of Korean firms have jointly 52% explanatory power for Korean firms' stock price during the period 1995- 2006. Comparing with U.S. firms' However, the value-relevance (R^2) of Korean firms is significantly lower than that of U.S. firms' the degree of value-relevance, that of Korean

Table 1: Descriptive statistics of four earnings quality proxies

Variables	Mean	Median	Max	Min	SD
Panel A: Persistence					
Earnings _{i,t}	0.057	0.038	20.086	-5.451	0.561
Earnings _{i,t-1}	0.052	0.039	61.256	-28.554	1.366
Panel B: Value-relevance					
P _{i,t}	20872.37	5690.000	1223000	42.0000	72361.42
BV _{i,t}	33473.35	15677.51	1302344	-840062.0	90503.62
EPS _{i,t}	2325.783	795.0000	550012.0	-226179.0	17174.30
Panel C: Conservatism					
ACC _{i,t}	-0.058	-0.054	10.412	-8.386	0.462
NOCF _{i,t}	0.226	0.000	1.000	0.000	0.418
OCF _{i,t}	0.112	0.092	19.505	-1.328	0.836
NOCF _{i,t} *OCF _{i,t}	-6.08E-12	0.000	0.000	-1.75E-09	4.63E-11
Panel D: Accruals quality					
TCA _{i,t}	0.004	0.008	5.289	-4.395	0.249
OCF _{i,t-1}	0.096	0.081	14.804	-2.242	0.601
OCF _{i,t}	0.112	0.092	19.505	-1.328	0.836
OCF _{i,t+1}	0.099	0.082	15.712	-2.319	0.622
ΔREV	0.036	0.063	14.050	-27.880	0.865
ε _{i,t}	0.067	0.012	4.570	1.31E-05	0.247

SD: Standard deviation

Table 2: Pearson correlation of four earnings quality proxies

Variables	Earnings _{i,t}		Earnings _{i,t-1}				
Panel A: Persistence							
Earnings _{i,t}	1						
Earnings _{i,t-1}	0.148***						
Panel B: Value-relevance							
P _{i,t}							
BV _{i,t}	0.714***						
EPS _{i,t}	0.379***						
Panel C: Conservatism							
ACC _{i,t}							
NOCF _{i,t}	0.084***						
OCF _{i,t}	-0.764***						
NOCF _{i,t} *OCF _{i,t}	0.124***						
Panel D: Accruals quality							
TCA _{i,t}							
OCF _{i,t-1}	0.198***						
OCF _{i,t}	0.122***	0.887***					
OCF _{i,t+1}	0.219***	0.877***					
ΔREV	-0.006	0.202	0.908***				
PPE	0.144	0.733	0.295***	0.059***			

***Significant at the 0.01 level. PPE: Property, plant and equipment

firms is relatively low because Collins et al. (1997) report 75% of the value-relevance (R^2) during the period 1983-1993. Similar to persistence, the value-relevance of Korean firms is not high, thus earnings quality as decision usefulness is low.

In Panel C of Table 3, empirical result of the degree of conservatism from Equation (3) is represented. Corresponding with previous studies, the coefficient of current operating cash flow (β_2) is significantly negative at 0.01 levels (-0.422). The degree of conservatism (β_3), the interaction term with negative operating cash flows dummy and current operating cash flow is positively significant (2.430) at 0.01 levels. The large (smaller) value of the incremental coefficient is, the more (less) conservatism is. The degree of conservatism (β_3) of Korean firms is 2.430. Compare with U.K firms, the Korean firms' conservatism is relatively

high. The degree of conservatism (β_3) of U.K firms is 0.34 for 10 years (1990-2000) reported by Ball and Shivakumar (2005). Higher degree of conservatism might be impacted by strong legal punishment caused by revised regulation for accounting fraud from Korean government similar to the Sarbanes-Oxley Act 2002 (the SOX). Strong legal punishment and legal obligations from government or courts tend to reduce overstatement of earnings, thereby reinforcing conservatism (Watts, 2003a; 2003b). In addition, Lobo and Zhou (2006) find that conservatism increases after the SOX because of strong legal punishments and penalties on firm's top manager such as CEOs and CFOs. Thus, reinforced regulation from Korean government plays an important factor to reduce over-estimated earnings, thereby increasing conservatism. The result of conservatism in this study accords with other similar studies.

Table 3: Empirical results of measuring earnings quality

Independent variables	Predicted sign	Coefficient	t-statistics	Adj R ² (F-statistics)
Panel A: Persistence				
Equation (1) Dependent variable=Earnings _{i,t}				
Constant	?	0.054	5.328***	0.023 (68.531***)
Earnings _{i,t-1}	±	0.061	8.279***	
Panel B: Value-relevance				
Equation (2) Dependent variable=P _{i,t}				
Constant	?	1865.913	1.928	0.522 (1661.763***)
BV _{i,t}	±	0.534	49.069***	
EPS _{i,t}	±	0.502	8.744***	
Panel C: Conservatism				
Equation (3) Dependent variable=ACC _{i,t}				
Constant	?	-0.015	-2.523**	0.616 (1610.962***)
NOCF _{i,t}	?	0.068	5.323***	
OCF _{i,t}	-	-0.422	-67.869***	
NOCF _{i,t} *OCF _{i,t}	+	2.430	15.856***	
Panel D: Accruals quality				
Equation (4) Dependent variable=TCA _{i,t}				
Constant	?	-0.004	-0.715	0.092 (52.556***)
OCF _{i,t+1}	+	0.110	4.489***	
OCF _{i,t}	-	-0.279	-10.829***	
OCF _{i,t+1}	+	0.235	10.652***	
ΔREV	+	0.004	0.833	
PPE	-	-0.005	-1.485	

***Significant at level 0.01. PPE: Property, plant and equipment

Panel D of Table 3 shows the result of accruals quality from Equation (4). The coefficients of previous operating cash flow (β_1) and future operating cash flow (β_3) are positively significant at 0.01 levels, whereas the coefficient of operating current cash flow (β_2) is significantly negative at 0.01 levels, consistent with previous research (Srinidhi and Gul 2007; Arthur et al., 2015). Moreover, the coefficient of future operating cash flows (β_3) is higher than that of previous operating cash flows (β_1). It means that future operating cash flow in Korean firms is more related to current accruals, compared to previous operating cash flow. However, changes in operating revenue (ΔREV) and property, plant and equipment are statistically insignificant.

5. CONCLUSION

In this study, we examine earnings quality over time using a sample 9,584 firm-year observations listed on the KSE over twelve year periods (1995-2006). This study uses earnings quality into two dimensions: Decision usefulness, measured as persistence and value-relevance and stewardship (or accountability), measured as conservatism and accruals quality following the conceptual framework of the IFRS.

This study finds that earnings quality of Korean firms is relatively lower than that of benchmark countries except for conservatism. High degree of conservatism results from reinforced legal punishments or penalties from government to reduce opportunistic behaviors of firm's management. However, overall earnings quality is still low. The result of this study implies that Korean firms engage in earnings management in the presence of economic incentives, thereby reducing earnings quality. Practically, our findings provide important implication for regulator of accounting standard setting because analysis of financial statements is meaningful indicator for economic efficiency of country.

We expect several contributions for accounting regulator and investors by providing empirical time-series analysis of financial statements. Thus, this comprehensive investigation of earnings quality provides more detailed insights into the role financial reporting quality.

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