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Market Consequences of Earnings Quality for Malaysian Listed Companies

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Abstract: This study draws on the theory that information risk, as posed by unreliable earnings figures is priced, and examines whether market penalises (rewards) companies for low (high) earnings quality. Two *ex ante* measures of cost of equity (Gebhardt *et al.*2001 (GLS) and Ohlson and Juettner-Nauroth 2000 (OJN)), and five accounting-based measures were estimated. A positive relationship between cost of equity estimates and earnings quality measures provided evidence that the market requires a higher return for a lower earnings quality. The results showed a significant positive relationship between earnings quality measures of accrual quality and predictability, with both estimates of cost of equity. The abnormal total accruals and abnormal current accruals were significantly related to OJN estimate of accruals quality only. The earnings quality measure of persistence, however, was not significantly related to either estimate of cost or equity.

Keywords : Accrual quality, cost of equity, earnings quality, information risks, predictability

I. Introduction

In response to the Asian financial crisis, the Malaysian regulators have taken an approach that places the responsibility of valuing the companies in the hands of market players. This market-based approach calls for a high quality of disclosures/ financial reporting and a high standard of corporate governance (Securities Commission Annual Report 2002). The role of regulators is to set standards to meet this need in order for market players to discern good performance in form and substance, and to make assessments accordingly.

This study is motivated by the emphasis given to this market-based approach to regulation and by the fact that earnings figures are widely used (Francis *et al.* 2003; Liu *et al.* 2002; Pricewaterhouse Coopers 2000). In broad terms, this research examines the market consequences of earnings quality and in particular whether market penalises or rewards companies for low or high earnings quality by requiring higher return or cost of equity for low earnings quality and vice versa.

There have been studies in the Malaysian context, for instance, those that examine the causes of earnings quality vis-à-vis earnings management (Mohd Saleh *et al.* 2005; 2007), but none have examined the consequences of earnings quality.

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Thus the contribution of the findings from this study is twofold. First, it contributes towards an understanding of the impact of quality of information, in particular earnings figures in a less developed capital market where the quality of information has only recently been given emphasis especially in the pricing of securities. The findings show evidence to support the theory that information risk is priced even in an emerging market. Second, this research fills the gap in previous Malaysian research where such research examined the determinants of earnings management as a single measure of earnings quality.

Section 2 describes literature relevant to the research. Section 3 describes the methodology followed by Sections 4 and 5 where the results and discussion are presented. Finally Section 6 concludes with highlights of the main findings and their implications.

2. Literature Review

2.1 Pricing of Information Risks

In the Capital Asset Pricing Model (CAPM), the only risk that is priced is the systematic risk of a company, that is, the covariance of the company cash flow in relation to the market portfolio. Other risks are idiosyncratic risks that are uncorrelated across companies. Investors could diversify away such risks by holding a portfolio of a large number of shares. As such, under this model, the risk posed by the quality of information such as accounting information, that is information risk, is not priced or does not explain cross-sectional differences of returns.

Easley and O'Hara (2001) and Leuz and Verrechia (2005) established a theoretical link between information risk and companies' cost of capital counter to CAPM analysis. Easley and O'Hara (2001) showed that the composition of public and private information could influence a company's cost of capital. Investors would want a higher return from companies that have more private and less public information. The high return reflects the risk that uninformed investors have to face by holding shares of such companies. Thus information risk is a type of systematic risk that is priced. Leuz and Verrechia (2005) demonstrated that higher information quality lowers the cost of capital because information quality could actually affect a company cash flow and not just perceived cash flow. In other words, if the quality of information such as earnings is suspected, then intuitively investors would want a higher return on their investment to compensate for the risk, that is the information risk, that they are taking.

2.2 Earnings Quality

As in previous studies such as that of Francis *et al.* (2004), this study is based on the premise that earnings quality is the statistical characteristics of earnings figure that are regarded as desirable or otherwise. It encompasses more than earnings management whether in good faith, such as in a situation where a well-informed manager manages earnings to signal to users, or in bad faith where a manager manages earnings to mislead users. In other words in this context, measures such as discretionary accruals indicate low quality earnings if the measure is large without regard to whether there has been earnings management in good or bad faith.

There is a number of characteristics for which earnings is assessed. Each characteristic incorporates the respective perspective of the role of earnings in users' decision making

framework. Thus there is no single agreed upon measure of earnings quality (Schipper and Vincent 2003). Francis *et al.* (2004), based on past research, categorised these characteristics as accounting based and market based. The accounting based earnings quality are accrual quality, persistence, predictability and smoothness whilst the market based are value relevance, timeliness and conservatism. The accounting-based attributes capture the uncertainty of future cash flows or earnings, whilst the market-based attributes capture the market, that is, investors' perception of such uncertainty. This research limits the scope of earnings quality to those that are accounting based, as it has been previously found to have a greater effect on cost of equity (Francis *et al.* 2004).

2.2.1 Accrual quality

This attribute measures how close earnings is to cash flow. High earnings quality is viewed as one that is close to cash flow or low in accruals. Unlike cash flow, the incidence and magnitude of accruals is subjected to management's discretionary accounting choice; therefore it could be subjected to management opportunistic action to mislead users, and is also influenced by a company's individual and industry characteristics.

In line with this view, two approaches to measuring accruals that lead to low quality earnings could be identified from past studies. In the first approach, studies identified the discretionary component of total accruals such as in Jones (1991) and Dechow *et al.* (1995), or they identified the discretionary component of specific accruals such as bad debts (McNichols and Wilson 1988). In both cases, the residuals from the regression of total or specific accruals on variables explaining the non-discretionary components of the respective accruals are measures of discretionary accruals. This measure of discretionary accruals is taken as a measure of earnings management that causes low quality earnings.

The second approach as found in the studies of Dechow and Dichev (2002) and Francis *et al.* (2004), focused on the direct relationship between accruals and earnings without regard to the discretionary/manipulative and non discretionary/ unintentional components as a measure of earnings quality. This approach views the role of accruals as being able to "adjust the recognition of cash flows over time so that the adjusted numbers (earnings) better measure firm performance" (Dechow and Dichev 2002). Thus the measure of earnings or accrual quality is the residual from the regression of changes in working capital on last period, current period and next period cash flows from operations.

2.2.2 Persistence

A desirable attribute of earnings is if it is permanent or recurring. Earnings is of high quality if it is sustainable or in the term used in past studies , persistent. This could be interpreted as a source of earnings from a company's core operations. Earnings low in persistence could be interpreted as of low quality in the sense that a significant part of a company's earnings is generated from sources that are temporary or 'managed' and therefore not recurring.

Formally in econometrics terms, persistence is a measure of how current period earnings shock (unexpected changes) is carried forward or persist in the future. Thus past studies employ time series economic forecasting methods with varying assumptions on the earnings process. For example, Francis *et al.* (2003), as in previous studies (Lev 1983; Ali and Zarowin 1992), employed autoregressive model of order 1 (AR1) to estimate persistence (slope

coefficient estimate) under the assumption that current period earnings depend on previous period earnings plus an error term. Other studies as described in Collins and Kothari (1989), used autoregressive integrated moving average (ARIMA) model where times series earnings are regarded as non stationary.

2.2.3 Predictability

As apparent from the term, predictability is the ability of existing earnings to predict future earnings (Lipe 1990; Francis *et al.* 2004). Earnings is of high quality if, for instance, investors could use the information on current pattern such as increasing earnings to predict future pattern, as a component of information that they use to evaluate the company.

Lipe (1990) and subsequently Francis *et al.* (2004) measured predictability as the variance of the shocks of the time series earnings (the variance of error term from the forecast model that measures persistence). As in measuring persistence, it is assumed that earnings process is a univariate time series. Earnings is high in predictability if the variance is low. The difference between predictability and persistence is that the former measures average absolute magnitude of unexpected changes and the latter measures the autocorrelation in earnings.

2.3 Earnings Quality, Information Risks and Cost of Equity

A number of studies have explored the link between information quality as proxied by a number of measures, and cost of equity. As most studies focus on the usage of information by equity investors, the measure for required return is the cost of equity. The following describes research related to information risk and cost of equity, where information risk is proxied by the level of disclosure (Botosan 1997; Botosan and Plumlee 2001; Chen *et al.* 2003) and where information risk is proxied by earnings characteristics or earnings quality (Francis *et al.* 2004)

Botosan (1997) examined the relationship between disclosure level and cost of equity. She developed a voluntary disclosure index from information in annual reports as proxy to disclosure level or quality. Estimates of cost of equity were based on the valuation formula developed by Edwards and Bell (1961), Ohlson (1995) and Feltham and Ohlson (1995) which states that market price of a company's share is equal to the sum of expected dividends discounted at the company's cost of equity. Botosan found a negative association between disclosure level and cost of equity after controlling for market risk (beta) and company's size for companies that attract a low analyst following. However, no significant association was found for companies that have high analyst following. The reason for this is that the disclosure index may not capture fully the level of information provided to investors as analysts play a significant role in disclosure.

Botosan and Plumlee (2001) re-examined the association between disclosure and cost of equity by segregating different forms of disclosure quality, that is, level and timely. Findings on relationship between disclosure level and cost of equity confirm previous results. However, a positive association was found between timely disclosure and cost of equity which is contrary to theoretical assertion. An explanation for this is that timely disclosure increases volatility of share prices and hence cost of equity.

Francis *et al.* (2004) examined the relationship between earnings attributes as proxy to information quality and cost of equity. Earnings attributes are categorised as market based and accounting based, each as described earlier. As a whole, their findings confirm previous

results of a negative relationship between earnings quality and cost of equity. When considered individually, the accounting-based earnings attributes, in particular accrual quality, have a larger effect on cost of equity than market-based attributes.

Chen *et al.* (2003) examined the effects of various corporate governance mechanisms and disclosure level on the cost of equity. They found a significant negative association between corporate governance mechanisms and disclosure level, and cost of equity. Their study was on Asia's emerging markets which included 42 Malaysian listed companies.

Whilst the above research documented well the relationship between information risk, as proxied by either disclosure level or earnings quality, and cost of equity, Francis *et al.* (2008) found evidence that earnings quality is the main driver of cost of equity. Specifically they found that although disclosure level is significantly related to the cost of equity measure, the significance is reduced when they examined the relationship conditional to earnings quality.

3. Methodology

3.1 Data Sources

The required accounting data, market value, book-to-market value, prices and beta were obtained from *Datastream* database for the financial year ended 2004 or as at financial year-end 2004 as applicable. For the purpose of estimating accrual quality accounting, data for years 2003 and 2005 are also required. Estimated earnings per share for years 2005 and 2006 required for calculating cost of equity were downloaded from Bloomberg database services in January 2005.

3.2 Sample Profile

The research is hindered by the availability of data pertaining to the cost of equity estimation, that is, the earnings forecast. At the onset of the research, only forecasted earnings for years 2005 and 2006 were available for 213 companies as shown in Table 1. Thus the sample comprises companies with IBES's estimated earnings per share for years 2005 and 2006. The sample size was first reduced due to the availability of data for the estimation of cost of equity. Since the data requirements varied for the calculation of the earnings quality measures, the composition of companies was further reduced into three samples: (1) ABRES (companies with data available to estimate ABRES), (2) ABSDATCA/ABSDATA (companies with data available to estimate ABSDATCA/ABSDAT), and (3) PERS/PRED (companies with data available to estimate PERS/PRED). Table 2 shows the number of companies in each sample. There were 70 companies common in all the three samples.

Table 1. Sample

Number of companies with estimated earnings forecasts	213
Eliminated due to change in accounting year end and insufficient data to calculate cost of equity	10
	203

Table 2. Sample size based on available data for the calculation of earnings quality variables

		(%)Market capitalisation
ABRES	141	31
ABSDATCA /ABSDATA	151	32
PERS /PRED	118	27

3.3 Variable Definition and Measurement

3.3.1 Accruals Quality

Aboody *et al.* (2005) operationalised two measures of accrual quality based on models developed by Jones (1991), Dechow *et al.* (1995) and Dechow and Dichev (2002) . The first measure of accruals' quality is defined as the amount of discretionary accruals (DA) or abnormal accruals. A large DA is associated with low quality. First non discretionary accruals (NDA) are measured from a model developed by Jones 1991 and subsequently modified by Dechow *et al.* 1995. This modified version is used in many earnings management studies. The estimation was done in the following manner (time *t* refers to year 2004) :

$$NDA/A_{t-1} = \alpha(1/A_{t-1}) + \beta(\Delta REV_t - \Delta REC_t)/A_{t-1} + \gamma PPE/A_{t-1}$$

where

NDA_t = non discretionary accruals at time *t*
A_{t-1} = total assets at *t*-1
ΔREV_t = change in revenues
ΔREC_t = change in receivables
PPE_t = gross plant,property and equipment at *t*

The coefficients α, β and γ were estimated from coefficients *a*, *b* and *c* of the following cross-sectional regression by industry:

$$TA_t/A_{t-1} = a(1/A_{t-1}) + b\,\Delta REV_t/A_{t-1} + cPPE_t/A_{t-1} + \delta_t$$

then $DA = TA_t/A_{t-1} - NDA/A_{t-1}$

where

TA = total accruals
= change in current assets – change in current liabilities – change in cash + change in short term debt – depreciation

In the following analysis, the absolute DA was taken and the acronym ABSDATA (absolute discretionary total accruals) assigned to the variable. The following analysis will also use the current accrual variation of the above model as given below.

$$NCA/A_{t-1} = \alpha(1/A_{t-1}) + \beta(\Delta REV_t - \Delta REC_t)/A_{t-1}$$

where

NCA_t = non discretionary current accruals at time t

The coefficients a and b are estimated from coefficients a and b of the following cross-sectional regression by industry:

$$TCA_t/A_{t-1} = a\,(1/A_{t-1}) + b\,\Delta REV_t/A_{t-1} + \delta_t$$

Then discretionary current accruals (DCA),

$$DCA_t = TCA_t/A_{t-1} - NCA_t/A_{t-1}$$

where

TCA_t = total current accruals

= change in current assets – change in current liabilities – change in cash + change in short term debt

The analysis used the acronym ABSDATCA (absolute discretionary total current accrual). The Bursa Malaysia classification of industry was used for the cross- sectional regression. The larger the discretionary accruals whether based on total accruals (ABSDATA) or total current accruals (ABSDATCA), the poorer the earnings quality.

The coefficient estimates of each industry found 39 companies in the construction industry, 80 in consumer products, 139 in industrial products, 36 in plantations, 47 in properties, 15 in technology and 124 companies in trading and services.

The second measure of accrual quality is based on the model of Dechow and Dichev (2002). It simply measures quality as how well accruals map current cash flows to last and future cash flows. It is the residual from the regression of changes in working capital of past, current and future cash flow. This study will use the cross-sectional version operationalised in Aboody *et al.* (2005) as follows:

$$TCA_{j,t}/Avasset_{j,t} = a + b\,CFO_{j,t-1}/Avasset_{j,t} + c\,CFO_{j,t}/Avasset_{j,t} + d\,CFO_{j,t+1}/Avasset_{j,t} + \delta_t$$

where

CFO =cash flow

= net income before extraordinary item – TA (total accruals)

Avasset - average asset ovet t and t-1

The coefficients a,b,c and d will be applied to individual companies current, past and future cash flows. The coefficient estimates of each industry found 36 companies in the construction industry, 76 in consumer products, 131 in industrial products, 37 in plantations, 37 in properties, 15 in technology and 120 companies in trading and services.

The difference between the predicted and actual company's total current accrual is the residual used as a measure of earnings quality. The acronym ABRES (absolute residual) is assigned to the variable. The larger the value of ABRES, the poorer the quality of earnings as the current accruals do not map well with current, past and future cash flows. If the residual is small, it means that the total current accruals is largely translated into cash flows.

3.3.2 Times series versus cross-section versions of Jones (1991) and Dechow and Dichev (2002)

To derive the company specific measures for discretionary accruals (both current and total) and for absolute residual of the cash flow mapping, this study used the cross- sectional regressions to obtain the relevant parameters in the respective models as in Aboody *et al.* (2005). Francis *et al.* (2004) used the time series version to obtain the absolute residuals.

Each approach has its own merits and demerits. The cross-sectional version arguably provides 'noisy measure' due to differences across companies in the same industry (Francis *et al.*2004)); however, the measure would not be bias towards companies that survive longer as would a measure from the time series version.

For purposes of this research, on balance, the cross-sectional approach is preferred as the time series approach provides parameters that are a company's own benchmark measures.. A previous study (Mohd Saleh 2003) on Malaysian data indicates that the cross-sectional approach provides measures that produce significant results.

3.3.3 Persistence and Predictability

The two measures, persistence and predictability, are estimated by assuming the earnings figures follow a time series process. The time series model used is the auto regressive of order one, as used in Francis *et al.* (2003; 2004) and Ali and Zarowin (1992). The model is as follows :

$$E_{j,t} = \phi_{0,j} + \phi_{1,j} E_{j,t-1} + \varepsilon_{j,t}$$

where

$E_{j,t}$ - earnings of firm *j* at time *t*

Persistence is the slope coefficient estimate $\phi_{1,j.}$ Earnings is of higher quality the higher the value of $\phi_{1,j}$. As the indication of high and low quality of earnings was opposite to the other measures of earnings quality, in the analysis the values of $\phi_{1,j}$ were negated. Persistence was assigned the acronym PERS.

Predictability is the absolute value of the residuals. A large value of predictability indicates low quality. An alternative measure of predictability is the standard deviation of the residuals from 5, 8 or 10 firm-year regressions. This measure not only requires earnings figure over a longer period, but also is reported to be strongly and negatively correlated with persistence. (Dechow and Dichev 2002; Francis *et al.* 2003). This study used the absolute value of the residuals as used in Aboody *et al.* (2005). Predictability was assigned the acronym PRED.

Francis *et al.* (2003) regressed earnings on lagged earnings over a period of ten years. So as not to reduce further the sample number, this study carried out the company specific regression over a eight-year period as in Dechow and Dichev (2002). Francis *et al.* (2003) carried out the regression based on the maximum likelihood method. As discussed in Gujarati (1995), the maximum likelihood has stronger statistical properties than an ordinary least squares method. However, the problem with maximum likelihood method is that the method cannot find a solution for certain data. For example, for the data in this study, the maximum likelihood method cannot be solved for a series of earnings measures for a certain company between 1998 and 2004.

The alternative to this method is ordinary least squares. Gujarati (1995) showed that the coefficient estimates based on maximum likelihood and ordinary least square methods are statistically equivalent in all cases. However, the maximum likelihood standard error estimate ($\sum \mu_i^2/n$) is biased whilst the ordinary least squares standard error estimate ($\sum \mu_i^2/(n-2)$) is not. As can been seem from the formula, they would be equivalent as n approaches ∞, in other words, for large samples. This study used ordinary least squares so as not to reduce further the sample size.

3.3.4 Cost of Equity

Two alternatives cost of equity measures were used. First, the cost of equity was estimated as in Chen *et al.* (2003) and Botosan (1997) based on a residual income model (Gebhardt *et al.* 2001) (GLS).

The cost of equity COE is the internal rate of return that equates the current value of a company and the intrinsic value of the company. The current value is the current share price. The intrinsic value is the current book value of equity and present value of future abnormal earnings. The infinite form of the relationship between current and intrinsic values is as follows:

$$P_t = B_t + \sum_{i=1}^{\infty} \left[\frac{(E_t(ROE_{t+i}) - COE)\, B_{t+i-1}}{(1+COE)^i} \right]$$

where

P_t = share price at time t
B_t = book value at time t
ROE_{t+i} = return on equity at time t
COE = cost of equity
$E_t(\cdot)$ = expectation based on information at t
$E_t(ROE_{t+i})$ = forecast earnings per share $(FEPS_{t+i}) / B_{t+i-1}$
$FEPS$ = forecasted earnings per share

As in Chen *et al.* (2003), the finite version of the above model will be used to estimate cost of equity, COE. In the finite version, an equilibrium ROE at time T needs to be estimated as the terminal ROE of the above summation series. There is no appropriate method to determine T, Chen *et al.*(2003) had chosen 6. However, they did estimate COE at various T from 4 to 12 and found that estimates of COE are highly correlated. See Appendix for an example of detailed calculation.

The second alternative measure of COE is estimated based on Ohlson and Juettner-Nauroth (2000) (OJN) and operationalised in Chen *et al.* (2003) as follows.

$$P_t = \frac{FEPS_{t+1}}{COE} + \frac{(FEPS_{t+2} - FEPS_{t+1} - COE \times FEPS_{t+1}(1-POUT))}{COE(COE-g)}$$

which then rearranges to find COE (and where POUT= dividend pay out ratio)

$$COE = A + \left(A^2 + \frac{FEPS_{t+1}}{P_t} \left(\frac{(FEPS_{t+2} - FEPS_{t+1})}{FEPS_{t+1}} - g \right) \right)^{0.5}$$

where $A = \frac{1}{2} \left(g + \frac{POUT \times FEPS_{t+1}}{P_t} \right)$

P_t = share price at time t
$FEPS$ = forecasted earnings per share
$POUT$ = dividend pay out ratio
g = estimated long term growth

This alternative measure avoids using book value in the estimation. Another important difference is that the long-term growth in the alternative estimation is proxied by the inflation rate of 1.4 per cent for year 2004 and that is the company-wide economic growth. Meanwhile, in the first estimation, earnings is assumed to grow towards the industry ROE.

3.3.5 Construct Validity of Measures

3.3.5.1 Cost of Equity

Cost of equity reflects the pricing of risks. Therefore, it should be related to the usual risk factors other than those information-related risks that are directly being tested in this study. Those risks factors are market value, book to market and beta. Both the cost of equity measures as discussed above are correlated with market value and book to market. However, they are not related to beta. This could be attributed to the limited sample size. Since the measure is significantly correlated with the other two risk measures, the cost of equity measures is considered to be reasonably valid.

3.3.5.2 Earnings Quality

For the earnings quality variables to be valid, they must be related to some of their economic determinants as demonstrated in Francis *et al.*(2008b). The cross-sectional measures of earnings quality (ABRES, ABSDATCA and ABSDATA) were tested with economic determinants of earning quality namely size, capital intensity and operating cycle. While persistence, PERS and predictability, PRED being time series attributes, were tested with standard deviation of revenue. ABRES was significantly related to size and capital intensity, but not with operating cycle. ABSDATCA and ABSDATA were significantly related to all its economic determinants. PERS was not related to size or standard deviation of revenue while PRED was significantly related to standard deviation of revenue . Therefore except for PERS, the earnings quality variables were valid representation of earnings quality.

4. Results

4.1 Descriptive Statistics and Bivariate Collinearity between EQ Variables

The different earnings quality measures (except for ABSDATA and ABSDATCA) represent different dimensions of earnings attributes. The values of the EQ variables are to be read as large for poor earnings quality.

The standard deviations of the earnings quality measures were found to be large relative to the means (Table 3). The mean to standard deviation ratios for the earnings quality were as follows:

ABRES 0.039/0.039 = 1
ABSDATCA 0.090/0.211 =0.43
ABSDATA 0.094/.208 =0.45
PRED 0.171/0.242 =0.71
PERS -0.215/0.414 =-0.52

However, a similar pattern prevailed in previous studies. Francis *et al.* (2004) reported mean/dispersion ratios of 0.026/0.023 = 1.13 for ABRES, -0.482/0.368 = -1.31 for PERS and 0.076/0.054= 0.83 for PRED. Francis *et al.* (2006) reporteda mean/ dispersion of 0.0465/ 0.0283= 1.64 for abnormal accruals. Similarly for studies on Malaysian data, a large standard deviation relative to means has been reported. In Mohd Salleh *et al.* (2007), a mean to standard deviation of -0.013/0.148 = -0.088 has been reported for discretionary accruals. Mohd Salleh *et al.* (2005) reported a similar ratio of -0.007/0.166= 0.042. Thus the high and low values of the earnings quality variables are treated as part of the sample. Table 4 provides Pearson correlation coefficients between the different EQ measures.

Table 3. Descriptive statistics of each earnings quality measures

Earnings quality measures	Observations	Minimum	Maximum	Mean	Standard deviation
ABRES	141	0.001	0.209	0.039	0.039
ABSDATCA	151	0.000	2.364	0.090	0.211
ABSDATA	151	0.000	2.335	0.094	0.208
PRED	118	0.007	1.429	0.171	0.242
PERS	118	-2.439	0.608	0.215	0.414

Table 4. Pearson correlation coefficients between variables

	ABRES	ABSDATCA	ABSDATA	PRED	PERS
ABRES	1.00				
ABSDATCA	0.22	1.00			
	0.01				
ABSDATA	0.19	0.99	1.00		
	0.02	***0.00***			
PRED	0.24	0.08	0.07	1.00	0.04
	0.02	*0.43*	*0.45*		*0.69*
PERS	-0.18	0.13	0.13	0.04	1
	0.07	*0.19*	*0.17*	*0.69*	

Note: The figures in italics are the probabilities with the significant ones at the least 10% given in bold.

As in Francis *et al.* (2004), each characteristic was treated as distinct dimensions of earnings quality. The Pearson correlation coefficients between the earnings quality variables were found to be between 21 to 48 per cent. The rather low correlation (except for between ABSDATA and ABSDATCA) is consistent with the view that they are distinct. ABSDATA and ABSDATCA are alternative measures of discretionary accruals, as such the correlation between these two variables is high.

Francis *et al.* (2008b) (with a different sample from Francis *et al.* (2004)) reported correlation coefficients between EQ measures of between 50 – 91 per cent. Thus they have used a common factor of earnings quality in their study.

4.2 Multivariate Analysis

To examine the relationship between cost of equity and each of the earnings quality measure the following regression was run.

$$COE = \varphi_0 + \varphi_{1,2,3,4,5} EQ_{1,2,3,4,5} + \varphi_6 SIZE + \varphi_7 \beta + \varphi_8 BTMV + \delta_{1,2}$$

EQ is each of the earnings quality measures of ABRES, ABSDATA, ABSDATCA, PERS and PRED. Thus the results in the column ABRES of Table 6 show the results of the regression when EQ is ABRES and so forth.

Table 5. Results of regression using GLS cost of equity estimate

	Predicted sign	ABRES	ABSDATA	ABSDATCA	PERS	PRED
(Constant)		9.721	12.479	12.569	8.974	9.296
t		*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Sig.						
EQ	+ve	**0.148**	0.023	0.058	-0.052	**0.244**
t		**2.102**	0.327	0.843	-0.695	**3.394**
Sig.		***0.037***	*0.744*	*0.400*	*0.488*	***0.001***
LGMV	-ve	**-0.192**	**-0.205**	**-0.192**	**-0.197**	**-0.188**
t		**-2.654**	**-2.880**	**-2.706**	**-2.474**	**-2.486**
Sig.		***0.009***	***0.005***	***0.008***	***0.015***	***0.014***
BETA	+ve	0.026	-0.008	-0.006	-0.043	-0.110
t		0.380	-0.120	-0.096	-0.578	-1.503
Sig.		*0.705*	*0.904*	*0.923*	*0.565*	*0.136*
LBTMV	+ve	**0.540**	**0.545**	**0.554**	**0.534**	**0.543**
t		**7.482**	**7.843**	**7.974**	**6.681**	**7.120**
Sig.		***0.000***	***0.000***	***0.000***	***0.000***	***0.000***
R2		0.375	0.384	0.386	0.376	0.431
F		21.987	24.347	24.598	18.637	23.918
Sig		***0.000***	***0.000***	***0.000***	***0.000***	***0.000***
N		141	151	151	118	118

Note: The figures in italics are the probabilities with the significant ones at the least 10% being bo

Table 6. Results of regression using OJN cost of equity estimate

	Predicted sign	ABRES	ABSDATA	ABSDATCA	PERS	PRED
(Constant)						
t		6.819	9.4679	9.508	7.021	7.249
Sig.		*0.000*	*0.0000*	*0.000*	*0.000*	*0.000*
EQ	+ve	**0.206**	**0.1606**	**0.169**	**-0.084**	**0.281**
t		**2.523**	**1.9962**	**2.114**	**-0.979**	**3.361**
Sig.		***0.013***	***0.0478***	***0.036***	***0.330***	***0.001***
LDMV	-ve	**-0.216**	**-0.2106**	**-0.207**	**-0.269**	**-0.256**
t		**-2.585**	**-2.5489**	**-2.508**	**-2.907**	**-2.906**
Sig.		***0.011***	***0.0118***	***0.013***	***0.004***	***0.004***
BETA	+ve	-0.005	-0.0342	-0.019	-0.010	-0.090
t		-0.060	-0.4510	-0.254	-0.116	-1.064
Sig.		*0.953*	*0.6527*	*0.800*	*0.908*	*0.289*
LEVMV	+ve	**0.270**	**0.2842**	**0.288**	**0.248**	**0.260**
t		**3.240**	**3.5199**	**3.564**	**2.670**	**2.920**
Sig.		***0.002***	***0.0006***	***0.000***	***0.009***	***0.004***
R2		0.166	0.1671	0.170	0.157	0.227
F		7.963	8.5241	8.670	6.463	9.613
Sig.		***0.000***	***0.0000***	***0.000***	***0.000***	***0.000***
N		**141**	**151**	**151**	**118**	**118**

Note: The figures in italics are the probabilities with the significant ones at the least 10% being bold.

The coefficient of each earnings quality measure is predicted to be positive. The results are given in Table 5 (using GLS COE) and Table 6 (using the OJN COE).

The R-squared statistics for all the regressions were significant. The problem of heteroskedasticity was dealt with by using the White's adjusted standard error where necessary. Multi-collinearity was not a problem as the VIF are all below 10.

In the regressions using GLS COE, ABRES and PRED had positive significant coefficients. ABSDATCA , ABSDATA and PERS did not explain variability in COE. In the regression using OJN COE, coefficients for all EQ variables except PERS were positive and significant.

As discussed in Section 3.3.5.2, ABRES was significantly related to capital intensity while ABSDATA/ABSDATCA each was related to capital intensity and operating cycle. These economic determinants when included in the above regressions, did not explain significantly both measures of cost of equity. The significance of the coefficients of the various earnings quality was not affected. As such, these economic determinants were not included in the final regressions, the results of which are given in Tables 5 and 6.

5. Discussion

Caveat is in order for the small sample size. The sample size was reduced a number of times by the lack of information to estimate the variables. Even though the final sample size was sufficient for the statistical analyses employed, the statistical inference made is somewhat

limited for generalisation. The results shed some light on the relationships studied and provide some evidence to support the hypotheses tested. Future research that includes more companies and years is needed to provide a robust set of results.

Earnings quality variables proxy information risk in terms of the risk associated with the reliability of information. As discussed in Francis *et al.* (2004), in general reliable earnings information assists investors to make investment decisions and without reliable information (as proxied by earnings quality measures) investors require a higher return.

The results from Tables 5 and 6 for accrual quality (ABRES) are consistent with this theory. For both measures of cost of equity, a high value of earnings quality measure (low earnings quality) is significantly associated with high COE. Investors demand high returns for companies with current accruals that map poorly with previous, current and future period cash flow. A large value of ABRES means a large proportion of accruals is not translated to cash flows or cannot be explained by cash flows in the preceding, current and future period. This implies also that a large proportion of earnings are not translated to cash flows and therefore the earnings figure is to be suspected.

Similarly for predictability, which provides a measure of how well earnings information can be used to predict future earnings, the regression results show significant association with both COE estimates. This is evident of not only the theory but also the reported importance of predictability by practitioners namely analysts. However, persistence is not similarly priced. Persistence supposedly measures the proportion of earnings that is recurring. It is to be noted that PERS is also not correlated with the established economic determinants of earnings as described earlier. This brings into question the construct validity of PERS.

Both the absolute discretionary accruals which are proxies of earnings management are significantly related to OJN COE measures but not to GLS COE. This is a fair evidence of abnormal discretionary accruals being priced.

6. Conclusion

There is a fairly strong association between the cost of equity and earnings quality. This finding is consistent in general with Francis *et al.* (2004; 2006) whose studies were conducted for companies in advanced capital markets. Therefore even in an emerging market, investors are sophisticated and price earnings quality with low earnings quality are being perceived as information risks.

This research adds new knowledge in the Malaysian context in that it examines the consequence in terms of cost of equity, of earnings quality whilst many studies have examined the causes of earnings quality. The findings on abnormal accruals and the significant results while consistent with other studies add to the body of knowledge as there has never been any Malaysian study that proves that abnormal accruals are priced. The consequence of this is that the preparer may gain in manipulation of accounts but stands to lose in terms of higher required return by investors.

Another important finding and therefore this paper's contribution is the significance of predictability as a dimension of earnings quality in required return. Whilst there have been many studies on Malaysian companies that examined abnormal accruals in relation to many variables such as board characteristics, managerial ownership, etc. there is none to date on

predictability, a dimension that standard setters have long expounded as an important attribute of accounting information. The finding that predictability is priced has an important implication for Malaysian standard setters and preparers of accounts. Given that predictability of earnings is priced, this quality is not an artificial construct that glossed statement of accounting objectives and has relevance in the market. An implication for standard setters is that in selecting a standard from a choice of treatments, careful consideration needs to be made on the impact of such treatment on the earnings figure, that is whether they will make the earnings figure more predictable or otherwise. This gives weight, for example, to the argument against fair valuation that makes earnings more volatile and possibly less predictable.

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APPENDIX: Calculation of cost of equity (COE) for ACP Industries

Div Payout ratio	0.3 t+1	0.3 t+2	0.3 t+3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
FEPS	0.026[1]	0.141[1]	0.7646[1]	0.8433[5]	0.916	0.978	1.026	1.055	1.061	1.041	0.993	0.915	
Beginning Book value [2]	2.79	2.8082	2.9069	3.4421	4.0328	4.6743	5.3592	6.0773	6.8155	7.5580	8.2865	8.9815	
Return on Equity (ROE)	0.00931[3]	0.05021[3]	0.263[3]	0.245[4]	0.227[4]	0.209[4]	0.191[4]	0.174[4]	0.156[4]	0.138[4]	0.120[4]	**0.102**[4]	**Target ROE**
COE [8]	**0.1376**	0.1376	0.1376	0.1376	0.1376	0.1376	0.1376	0.1376	0.1376	0.1376	0.1376	0.1376	
Book value	Streams residual income discounted at COE												**Share Price**
2.79	-0.3146[6]	-0.1896	0.2476	0.2210	0.1897	0.1547	0.1169	0.0778	0.0384	0.00023	-0.03571	-0.06826	-0.49605[7]	**2.73**

The publicly available data required are the dividend payout ratio (which is either a company's historical three year median or the industry three year median), short term growth rate (extrapolated from the two years IBES forecasted earnings), analysts forecasted earnings for two subsequent years (FEPS, which are IBES forecasted earnings), the target return on equity (industry historical five-year median), book value (at balance sheet date) and share price at balance sheet date. To operationalise the above formula, the purpose of this estimation is to obtain a COE that when applied to the residual income of a company, that is, the summation series in the above formula, the sum of the current book value 2.79 and the discounted residual income of the company equals the current share price. Thus that is the implied required return by the market.
The steps in estimating COE is :

1. FEPS for t+1 and t+2 are 0.026 and 0.141. The implied growth rate = (0.141-0.026)/0.026 = 4.42. thus $FEPS_{t+3}$ = (1+g) x $FEPS_{t+2}$=(4.42+1) x .141 = **0.7646**

Appendix continued on next page

Appendix. Continued

2. The book value per share for end of financial year 2004(or beginning of 2005) is 2.79. For subsequent years the book value (B) is estimated as given below.
   $B_{t+1} = B_t$ + EPS (1-Payout ratio)
   for example for 2005, B = 2.79 + 0.026(1-0.30) = **2.8082**
3. The return of equity for years t+1, t+2 and t+3 is FEPS/ Beginning book value. For example, ROE_{t+1} = 0.026/2.79 = **0.00931**
4. The return on equity for years t+4 onwards are assumed to be approaching the industry target of 0.102. In other words, this method assumes that in the long run, each company's return will approach the industry's average. An interpolation is carried out for years between t+4 to the industry target. For example ROE_{t+4} = 0.263 – (0.263-.102)/9 = **0.245**. At this stage, streams of book value and ROE estimates are completed.
5. $FEPS_{t+4}$ onwards can now be completed by taking ROE x Book value estimates. For example, $FEPS_{t+4}$ = 0.245 x 3.4422 = **0.8433**
6. For each of the 12 years, beginning from year t+1 (or 2005), the residual income is estimated as follows :
   $(ROE^{t+1} - COE) \times (1/(1+COE)^{1....12}) \times B_t$
   So for t+1, $(0.00931 - COE)/ (1/(1+COE)^{1}) \times 2.79$
7. In this finite version of the model, a terminal value is estimated as $(ROE^{t} - COE) \times (1/((1+COE)^{12} COE)) \times B_t$
8. The value of COE, **0.1376**, is obtained by trial and error, in such a way that makes the sum of the book value (2.79), the series of discounted residual income and the last terminal value equals the share price **2.73**.

Calculation of alternative ONJ cost of equity estimate
Example : ACP Industries

$$A = 0.5 \left(0.014 + \frac{0.3 \times 0.026}{2.73}\right)$$

$$= 0.00843$$

$$COEA = 0.00843 + \left(0.00843^{2} + \frac{0.026}{2.73}\left(\frac{0.141 - 0.026}{0.026} - 0.014\right)\right)^{0.5}$$

$$= 0.2135$$