



THE IMPACT OF QUALITY OF ACCOUNTING INFORMATION ON COST OF CAPITAL: INSIGHT FROM AN EMERGING ECONOMY



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ABSTRACT

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The aim of this study is to determine the impact of the quality of accounting information on the cost of capital in the firms listed on the Pakistan Stock Exchange (PSX). The study focuses on the fundamental qualitative attributes of accounting information mentioned in the Statement of Financial Accounting Concepts (SFAC) No. 8. These attributes comprise predictive value, neutrality, completeness and free from error. The cost of capital is measured using the discounted cash flow technique. Very few studies have been conducted using the discounted cash flow technique in relation to emerging stock markets, as compared to developed stock markets. Data were collected from the companies belonging to the non-financial sector of the PSX from 2001 to 2019. The regression analysis results showed that the attributes of accounting information—predictive value, neutrality, completeness and free from error—impact the cost of capital in the PSX. A systematic pattern analysis of risk-adjusted portfolio returns also revealed that these qualitative attributes are genuine risk factors and are not created by chance due to the inefficiency of the market. A policy implication of this finding is that potential investors should consider the qualitative attributes of accounting information before making their investment decisions.

Contribution/ Originality: This study analyzes the impact of fundamental qualitative attributes of accounting information, mentioned in SFAC No. 8, on the cost of capital. The study is one of very few conducted in emerging markets that have used a discounted cash flow technique to measure the cost of capital.

1. INTRODUCTION

The relation between accounting information and the cost of capital is demonstrated to be a fundamental issue in the accounting literature (Lambert, Leuz, & Verrecchia, 2007) and has captured much more space in finance literature. Arthur Levitt, the former chairman of the United States Securities and Exchange Commission (SEC), suggested that high-quality accounting standards reduce the cost of capital as investors with high-quality information can make better investment decisions (Levitt, 1998). André, Filip, and Moldovan (2016) suggested that high-quality accounting information reduces uncertainty, and that investors and firms attach much importance to such information.

Accounting information available in financial reports is used to measure firms' risk factors and estimate their expected returns (Asif, Arif, & Akbar, 2016; Gebhardt, Lee, & Swaminathan, 2001). Also, keeping in view the free

hand in accounting choices permitted by International Financial Reporting Standards (IFRS) to the firms' managers, the quality of accounting information cannot be thought of as irrelevant in the study of risk in relation to a particular firm. The Financial Accounting Standards Board (FASB) issues statements of financial accounting concepts (SFACs). These statements cover broad financial reporting concepts. FASB, in coordination with the International Accounting Standards Board (IASB), has issued SFAC No. 8 which covers the qualitative attributes of accounting information. According to SFAC No. 8, the fundamental qualitative attributes of accounting information comprise relevance and representational faithfulness. Relevance refers to predictive value or confirmatory value, and representational faithfulness refers to neutrality, completeness and free from error within accounting information. As per SFAC, any information lacking these particular qualities is useless, even if it has other, enhancing qualities. Therefore, the focus of this study is to analyze the impact of the fundamental qualitative attributes mentioned in SFAC No. 8 on the cost of capital.

The cost of capital has long remained the center of attention in finance. Hou, Van Dijk, and Zhang (2012) stated that estimating the cost of capital and its relationship with a firm's fundamental characteristics is a central theme in finance and capital markets research in accounting. Although under investigation for more than six decades, a unified model for the relationship is yet to be developed. However, the latest development in the cost of capital determination is the implied cost of capital (ICC) which uses discounted cash flows and market prices to derive the implied rate of return required by the investors. ICC estimates are less noisy than the cost of capital measured with the capital asset pricing model (CAPM) or the Fama–French three-factor model. The ICC model, due to its complexity, has not been applied to the majority of emerging markets. In Pakistan only Shah, Khan, and Afraz (2018) have applied ICC to determine the relationship between implied cost of equity and corporate life cycle. This gives an edge to this study's use of the ICC technique in the context of the emerging market of Pakistan.

One of the essential agents of economic growth is the capital market. On the basis of reforms introduced by the Securities and Exchange Commission of Pakistan (SECP), the Government's investment-friendly policies, and the country's macroeconomic indicators, Morgan Stanley Capital International (MSCI) upgraded Pakistan from the status of Frontier Market to that of Emerging Market in 2017. The SECP and the Pakistan Stock Exchange (PSX) are in continuous communication with MSCI to highlight reforms in the pipeline and recent capital market achievements to meet the demands of the market's changed status. According to a press release from the World Bank on October 24th, 2020, due to regulatory reforms, Pakistan now ranks as one of the world's top ten business-climate improvers and is 108th in the global ease of doing business index. The reforms undertaken by SECP have significantly improved the investment climate of the country. Now Pakistan is attracting investment (foreign as well as domestic) that is enhancing growth opportunities. In this context, a study that brings insight into Pakistan's emerging equity market is indispensable.

In particular, this study seeks to analyze the impact of the qualitative attributes of accounting information as outlined in SFAC No. 8 on the cost of capital for the non-financial firms listed on the PSX. This analysis is carried out by investigating the following: (1) the impact of the qualitative attributes of accounting information on the cost of capital, and (2) the presence of any systematic pattern in risk-adjusted portfolio returns, in order to determine whether the qualitative attributes of accounting information are genuine risk factors priced into the equity market of Pakistan.

2. LITERATURE REVIEW

Ball and Brown (1968) presented the seminal work on the risk relevance of accounting information. Rather than a rigorous theory, their work was motivated by economic intuition. They stated that the earlier work of Markowitz (1952) was extended in the studies of Sharpe (1964) and Lintner (1965) to a simplified portfolio model. This model has both a priori and empirical support and is known as the CAPM (capital asset pricing model). But the knowledge of determination of risk is still incomplete in one important aspect—that is, what exogenous data, other

than price data, are included in the assessment of prices and changes in prices, which gives rise to systematic risk. The findings of Ball and Brown's study revealed a positive correlation between individual components and systematic risk. They suggested that accounting information provides a useful insight into several relationships that have the potential to reflect both individual and systematic risk.

Beaver, Kettler, and Scholes (1970) studied asset growth, asset size, liquidity, financial leverage, dividend payout, accounting beta, and variance in earnings in relation to the systematic risk. They evidenced the practical use of accounting information in the prediction of systematic risk and even their best-fit model can better predict systematic risk than the market beta. Their best-fit model consisted of three variables: asset growth, dividend payout ratio, and earnings variability. Subsequent researchers (Beaver & Manegold, 1975; Bildersee, 1975; Rosenberg & McKibben, 1973) expanded upon the accounting variables and the 1970s are characterized by inductive data-driven research in which various accounting variables were studied. The broad finding of these empirical studies was that accounting information is useful in determining systematic risk.

Until the 1970s, the focus remained on the examination of the relative risk relevancy of accounting variables. Studies found accounting variables had the potential to explain systematic risk. These studies relied on the supposition that market beta is a major factor in determining the cost of equity. But the majority of the work on the cost of equity such as Roll (1977); Elton, Gruber, Das, and Hlavka (1993); and Fama and French (2004) suggested that systematic risk (market beta) has low explanatory power to explain the cost of equity. During the 1970s researchers shifted the use of accounting information from the prediction of systematic risk to the cost of capital (Roll, 1977). Various studies such as Nekrasov and Shroff (2009); Jensen, Lando, and Medhat (2017) and Intrisano, Di Nallo, Calce, and Micheli (2018) found that accounting information can explain variations in the cost of capital.

In Pakistan, several studies have found an association between accounting information and the cost of capital. These studies have examined various accounting variables including leverage, earnings volatility, size of firm, dividend yield, payout ratios, and asset growth (Irfan, Nishat, & Sharif, 2002); book value per share, earnings yield, and dividend yield (Khan, Gul, Rehman, Razzaq, & Kamran, 2012); operating cash flow per share, capita employed per share, earnings per share and book value per share (Asif et al., 2016); price-to-earnings ratio, earnings per share, leverage, return on assets, current ratio, and price-to-earnings ratio (Muhammad & Ali, 2018). The broad finding of these studies was that accounting variables are relevant and important to explaining the cost of capital in Pakistan.

During the late 1990s, the increased globalization of the financial and product markets raised the concerns of market participants and regulators about the quality of financial reports worldwide. Market participants seek to have high-quality financial information. Arthur Levitt, when chairman of the US SEC of the United States, stated that he firmly believed that the triumph of capital itself was contingent on the quality of accounting information (Levitt, 1998). High-quality information increases investors' confidence in the credibility of financial reporting, and without this confidence capital markets cannot succeed. Levitt further argued that selective disclosure allows those who have private information in advance to avoid a loss or to make a profit at the expense of those who do not have access to that information and this practice leads to a loss of investors' confidence. Easley and O'hara (2004) suggested that differently informed investors hold different securities in their portfolios and in so doing they willingly take idiosyncratic risk.

Francis, LaFond, Olsson, and Schipper (2004) examined the association between seven attributes of earnings and the cost of capital. The attributes studied included: quality, smoothness, persistence, predictability, timeliness, conservatism and value relevance. They found that earnings attributes based on accounting—that is, earnings persistence, value relevance and earnings quality—are strongly related to the cost of capital, more so than market-based earnings attributes. Haque and Sarwar (2013) examined the determinants of the cost of capital in the Pakistani equity market. They found that market risk and discretionary accruals can explain the cost of capital. These two factors increase the risk and required rate of return on an investment. Prior studies had found attributes of accounting information such as accrual quality (Verdi, 2005), asymmetry in information (Armstrong, Core,

Taylor, & Verrecchia, 2011), the quality of the auditor (Houqe Hsieh, Shiu, & Chang, 2019), discretionary estimation error (Houqe Hsieh et al., 2019), accruals-based earnings quality (Hong, Ma, & Zhang, 2019), earnings management (Junior, Carneiro, Louzada, Zanquetto Filho, & Bortolon, 2020), and integrated reporting quality (Vitolla, Salvi, Raimo, Petruzzella, & Rubino, 2020) to be strongly related with the cost of capital.

A review of the literature thus shows that accounting information has a strong association with the cost of capital. It is noted that prior studies that have examined qualitative dimensions of accounting information have not mentioned any source for the selection of the qualitative attributes. This study makes a contribution by examining the specific qualitative characteristics of accounting information mentioned in Statement of Financial Accounting Concept (SFAC) No. 8. According to SFAC No. 8, the fundamental qualitative characteristics of accounting information are relevance and representational faithfulness; and the enhancing qualitative characteristics are comparability, timeliness, verifiability, and understandability. The relevance and representational faithfulness of accounting information make the information useful to the decision-making process. Relevance is based on predictive value and/or conformity value and representational faithfulness is based on the information's neutrality, completeness and free from error. Information lacking these fundamental qualities is not useful and cannot be made useful with the enhancing qualities (SFAC No. 8). Based on the above discussion the following hypotheses are made for this study.

H₀₁: The predictive value of accounting information has a significant impact on the cost of capital.

H₀₂: The neutrality of accounting information has a significant impact on the cost of capital.

H₀₃: The completeness of accounting information has a significant impact on the cost of capital.

H₀₄: Error-free accounting information has a significant impact on the cost of capital.

3. METHODOLOGY

3.1. Data Sources and Sample Details

This study involves two main steps. In the first stage, forecasted earnings are estimated with the use of accounting data from 2001 to 2012. These forecasted earnings are used to estimate the cost of capital using discounted cash flow technique (ICC). In the second stage, the relationship between accounting measures of risk and the cost of capital is estimated using data from 2013 to 2019. Accounting data is extracted from the financial reports of respective firms and stock price data is obtained from the PSX. A total of 430 non-financial firms are listed on the PSX. After applying inclusion/exclusion criteria—that is, to be included in the sample, a firm must have: (1) data available for at least 14 years (i.e. from 2006 to 2019), and (2) positive equity—the final sample consisted of 217 non-financial firms.

3.2. Variables

To measure the impact of qualitative attributes of accounting information on the cost of capital, four ICC models are used to measure the cost of capital, detail of which is provided in Section 3.2.1. Independent variables include the fundamental qualitative attributes mentioned in SFAC No. 8. These are: predictive value (PV), neutrality (Nu), completeness (Ct), and free from error (FE). Three other independent control variables comprise: accounting beta (AB), financial leverage (FL), and growth (Gr). Measurements, expected signs and references for independent variables are as in Table 1.

Table 1 shows the measurement of the seven independent variables used to estimate the cost of capital.

Table-1. Measurement of Independent Variables.

Variables	Measurements	Expected Sign	References
PV	$E_{i,t+1} = \alpha_0 + \beta E_{i,t} + \varepsilon_i$ Where, E is annual earnings, ε is residual, used as inverse measure of PV. High value of ε shows low predictive value.	+	Francis et al. (2004)
Nu	$TA_{it}/Assets_{it-1} = \alpha_0(1Assets_{it-1}) + \beta_1(\Delta REV_{it} - \Delta REC_{it}/Assets_{it-1}) + \beta_2(PPE_{it}/Assets_{it-1}) + \epsilon_{it}$ Where, $TA_t = NI_t - CFO_t$, TA is total accruals, NI is net income, CFO is cash flow from operations. PPE is property plant and equipment, ΔREV_i is change in revenue, and ΔREC is the change in receivables. High value of TA shows that information is less neutral or biased.	+	Following Verdi (2005) and Latif, Latif, and Abdullah (2017))
Ct	Measured as a dummy variable that has value of 1 if there is restatement in the previous year financial reports; otherwise 0.	+	Agrawal and Cooper (2017)
FE	Measured as the percentage of firms audited by a single auditor in the respective industry. A higher market share shows an audit firm to have more industry specialization and thus greater free from error.	-	Balsam, Krishnan, and Yang (2003)
AB	Measured from a linear regression between firm return on assets (independent variable) and the market average of return on assets (dependent variable).	+	Hill and Stone (1980) and Rutkowska-Ziarko and Pyke (2017)
FL	Total liabilities divided by total assets.	+/-	Beaver et al. (1970)
Gr	Total assets in year t divided by total assets in year t-1.	+/-	Beaver et al. (1970)

3.2.1. Measurement of Implied Cost of Capital (ICC)

The first ingredient for the computation of ICC models is forecasted earnings. For this purpose, we follow the model-based approach to forecast earnings proposed by Hou et al. (2012). The pooled cross-sectional model is as follows:

$$E_{i,t+j} = \alpha_0 + \beta_1 A_{i,t} + \beta_2 D_{i,t} + \beta_3 DD_{i,t} + \beta_4 E_{i,t} + \beta_5 NegE_{i,t} + \beta_6 AC_{i,t} + \varepsilon_{i,t+j} \quad (1)$$

Where, $j = 1$ to 5 , E is earnings of firm, A is total assets, D represents dividend payment; DD is a dummy variable, the value of which is 1 if the firm has paid a dividend, otherwise 0. NegE represents negative earnings. It is also a dummy variable, the value of which is 1 if firm has negative earnings, otherwise 0. AC represents accruals. From 2001 to 2012 accruals are measured using the cash flow statement method by taking the difference between net income and cash flows from operations.

Equation 1 is estimated each year using the previous ten years' data. Earnings forecasts are then computed for up to seven years by multiplying the independent variables of year t with the coefficients of the cross-sectional earnings forecast model, estimated using the previous ten years' data. By this means, earnings forecasts are ensured to be out of sample. For the computation of earnings forecasts it is necessary to have data for the independent variables at least for year $t+1$, $t+2$ up to $t+5$ in year t.

Four individual ICC models along with a "composite" ICC—that is, the average of the four ICC models—is measured. These four models include the models presented by Claus and Thomas (2001), Gebhardt et al. (2001), Easton (2004), and Ohlson and Juettner-Nauroth (2005). ICC models are estimated by using the model-based earnings forecasts for up to five years into the future and the market price of the stock. A reporting lag of three

months is imposed for the estimation of ICC to ensure that at the time of ICC estimation the information used in the earnings forecast is publicly available. The description of the four ICC models is as follows.

3.2.1.1. Claus and Thomas (2001) Model for the ICC (ICC_CT).

Claus and Thomas (2001) used market equity, abnormal (residual) earnings and growth rate to compute ICC. The model is as follows:

$$M_t = B_t + \sum_{k=1}^5 \left(\frac{E_t[(ROE_{t+k} - R) \times B_{t+k-1}]}{(1+R)^k} \right) + \left(\frac{E_t[(ROE_{t+5} - R) \times B_{t+4}](1+g)}{(R-g) \times (1+R)^5} \right)$$

Where, R is ICC, derived from the residual income model; M_t is the market value of the equity in year t ; E_t is the market expectations of earnings based on information in year t ; B_t is the expected book value of equity. Using clean surplus accounting, book equity in the current year is the previous year's book equity plus forecasted earnings minus forecasted dividends, which is written as $B_{t+k} = B_{t+k-1} + E_{t+k} - D_{t+k}$. Dividend is measured using dividend payout ratio and, for negative earnings firms, payout ratio is estimated using the dividend paid divided by 0.06*total assets. $(ROE_{t+k} - R) \times B_{t+k-1}$ is the residual income in year $t+k$. It can be written as $NI_{t+k} - R \times B_{t+k-1}$ —that is, the net income minus the ICC multiplied by the book equity in the previous year. The term $(ROE_{t+k} - R) \times B_{t+k-1}$ is described as the difference between the return on book equity and the ICC multiplied by the book equity in the previous year. Claus and Thomas (2001) assumed that earnings grow at a constant rate beyond five years—that is, at the expected inflation rate. Following Claus and Thomas (2001), we also measure g as the current risk-free rate minus 3% (the real inflation rate).

3.2.1.2. Easton (2004) Model for the ICC (ICC_MPEG)

$$M_t = \frac{E_t[E_{t+2}] + R \times E_t[D_{t+1}] - E_t[E_{t+1}]}{R^2}$$

Where, R is ICC and M_t is the market value of the equity in year t . E_t denotes market expectations of earnings based on information available in year t . E_{t+1} and E_{t+2} are the forecasted earnings per share in year $t+1$ and year $t+2$ respectively. D_{t+1} is the dividend in year $t+1$ and is measured using current dividend payout ratio for firms with positive earnings; for negative earnings firms, payout ratio is estimated using the dividend paid divided by 0.06*total assets.

3.2.1.3. Ohlson and Juettner-Nauroth (2005) Model for the ICC (ICC_OJ)

Ohlson and Juettner-Nauroth (2005) used expected earnings per share (EPS) and expected growth in earnings per share to compute ICC. Their model is

$$R = A + \sqrt{\left(A^2 + \left(\frac{E_t[E_{t+1}]}{M_t} \right) \times (g - (y - 1)) \right)}$$

Where,

$$A = 0.5 \left((y - 1) + \left(\frac{E_t[D_{t+1}]}{M_t} \right) \right)$$

$$g = 0.5 \left(\frac{(E_t[E_{t+3}] - E_t[E_{t+2}])}{E_t[E_{t+2}]} + \frac{(E_t[E_{t+5}] - E_t[E_{t+4}])}{E_t[E_{t+4}]} \right) +$$

Where, R is ICC, M_t is the market value of the equity in year t, E_t is the market expectations of earnings based on information in year t, and E_{t+1} is expected earnings per share in year t+1. D_{t+1} is the dividend in year t+1 and is measured using current dividend payout ratio for firms with positive earnings; for negative earnings firms, payout ratio is estimated using the dividend paid divided by 0.06*total assets. y is the perpetual growth rate in abnormal earnings beyond the forecast horizon and measured as risk-free rate minus 3%. g is the short-term growth rate; g is measured as the average of forecasted near-term growth and five-year growth.

3.2.1.4. Gebhardt et al. (2001) Model for the ICC (ICC_GLS)

Gebhardt et al. (2001) used market prices and residual income for the estimation of ICC.

$$M_t = B_t + \sum_{k=1}^{11} \left(\frac{E_t[(ROE_{t+k} - R)xB_{t+k-1}]}{(1+R)^k} \right) + \left(\frac{E_t[(ROE_{t+12} - R)xB_{t+11}]}{R(1+R)^{11}} \right)$$

Where, R is ICC and M_t is the market value of the equity in year t. E_t is the market expectations of earnings based on information in year t; B_t is the book value of equity (computed as for ICC_CT). Dividend is measured using dividend payout ratio; for negative earnings firms, payout ratio is estimated using the dividend paid divided by 0.06*total assets. $(ROE_{t+k} - R)xB_{t+k-1}$ is the residual income in year t+k. It can be written as $NI_{t+k} - R*B_{t+k-1}$ —that is, the net income minus the ICC multiplied by the book equity in the previous year.

Expected ROE for years t+1 to t+3 is estimated using a model-based earnings forecast. After year t+3, earnings are forecasted by mean reverting the period t+3 ROE to the median industry ROE by period t+k. The notion of mean reversion in ROE is that the abnormal ROE erodes overtime and in the long-run individual firms tend to become like their peers in the industry. Industry target ROE is a moving median computed using at least the past five years' and maximum ten years' ROEs from all firms in the same industry. Loss-making firms are excluded from the estimation of industry median ROE because profitable firms can better reflect the long-term industry equilibrium rates of return. Mean reversion is achieved through simple linear interpolation between period t+3 ROE and the industry median ROE.

3.3. Data Analysis Procedure and Model Specification

For the normality of data, residual-versus-predictor plots (RVPPlot) and Rstudent test are applied. The variance inflation factor for all the variables is found to be below five. The White test is conducted to check for heteroskedasticity. The data in this study are unbalanced panel data and, according to Lechner, Rodriguez-Planas, and Fernández Kranz (2016), ordinary least squares (OLS) on an unbalanced panel may be preferable because it is likely to be more precise than the fixed effect estimator. Therefore, for testing the hypotheses, OLS regression analysis was conducted through the use of Stata to determine the relationship between the qualitative attributes of accounting information and the cost of capital.

The cost of capital (ICC) is modelled using the following OLS regression equations for the four measures of ICC and their average. This equation estimates individually for four separate estimates of ICC and their average.

$$ICC_i = a_{0i} + b_1Gr_i + b_2AB_i + b_3FL_i + b_4PV_i + b_5Nu_i + b_6Ct_i + b_7FE_i + e_i \quad (2)$$

Where, ICC is a dependent variable; and Gr (growth), AB (accounting beta), and FL (financial leverage) are control independent variables. PV (predictive value), Nu (neutrality), Ct (completeness), and FE (free from error) are qualitative attributes of accounting information—that is, the main independent variables.

3.4. Analysis of Systematic Pattern in Portfolio Returns

The qualitative variables that are found to be significantly associated with the cost of capital in regression analysis are further analyzed to examine the systematic pattern in risk-adjusted portfolio returns formed on the basis of these qualitative attributes. Fama (1998) suggested that, due to inefficiency in the market, risk factors are generated by chance and these are not the real risk factors to be priced. For this purpose, we followed Fama (1998) and Hou et al. (2012) to analyze the systematic pattern in risk-adjusted portfolio returns. Three portfolios (P1, P2 and P3) are formed on the basis of predictive value, neutrality, and free from error; and two portfolios (P1 and P2) on the basis of completeness. Portfolio returns (R_{P1} , R_{P2} and R_{P3}) are calculated for each of these portfolios and these returns are then regressed using CAPM and the Fama–French three-factor model. The econometric models are as follows.

Using CAPM:

$$R_{p1i} - R_{fi} = \alpha_{p0} + \beta_{p1}(R_{mi} - R_{fi}) + \varepsilon_{pi}$$

$$R_{p2i} - R_{fi} = \alpha_{p0} + \beta_{p1}(R_{mi} - R_{fi}) + \varepsilon_{pi}$$

$$R_{p3i} - R_{fi} = \alpha_{p0} + \beta_{p1}(R_{mi} - R_{fi}) + \varepsilon_{pi}$$

Using the Fama–French three-factor model

$$R_{p1i} - R_{fi} = \alpha_{p0} + \beta_{p1}(R_{mi} - R_{fi}) + \beta_{p2}(SMB_i) + \beta_{p3}(HML_i) + \varepsilon_{pi}$$

$$R_{p2i} - R_{fi} = \alpha_{p0} + \beta_{p1}(R_{mi} - R_{fi}) + \beta_{p2}(SMB_i) + \beta_{p3}(HML_i) + \varepsilon_{pi}$$

$$R_{p3i} - R_{fi} = \alpha_{p0} + \beta_{p1}(R_{mi} - R_{fi}) + \beta_{p2}(SMB_i) + \beta_{p3}(HML_i) + \varepsilon_{pi}$$

Where, R_{fi} is the monthly risk-free rate, R_{mi} is monthly return on market portfolio, SMB is the difference between the returns on the portfolios of small and big firms, and HML is the difference between the returns on the portfolios of high book-to-market ratio stock and small book-to-market ratio stock.

4. EMPIRICAL RESULTS

Panel A of Table 2 comprises descriptive statistics showing the number of observations, the mean, standard deviation, minimum and maximum values of the variables used in the estimation of forecasted earnings. Panel B of Table 1 comprises the descriptive statistics of the dependent and independent variables (shown in Equation 2). Table 2 shows that the number of observations of ICC_CT, ICC_MPEG, ICC_OJ, ICC_GLS and average_ICC are 851, 830, 904, 864 and 905 respectively. The difference in the number of observations of the four ICC estimates is

due to their differing measurement requirements. For the model that required a larger number of expected future earnings, the lesser observations of that model are estimated.

Table 3 reports the Pearson's correlation between dependent and independent variables. Table 3 shows that all four ICC estimates and their average are positively correlated with predictive value, neutrality, and completeness of accounting information, while these are negatively correlated with the free from error attribute of accounting information. Correlation coefficients between dependent and independent variables range from -0.212 to 0.332; also, no independent variable is very strongly correlated with the any other independent variable.

Table-2. Descriptive Statistics of Variables.

Panel A: Descriptive statistics of Variables used in Estimation of Forecasted Earnings					
Variables	No. of Observations	Mean	Std. Dev.	Minimum	Maximum
TA	3,600	8.142	12.014	0.235	52.548
NI	3,600	0.524	1.002	-0.206	3.970
D	3,600	0.532	2.715	0	40.858
DD	3,600	0.601	0.521	0	1
NegE	3,600	0.197	0.436	0	1
AC	3,600	-0.412	1.172	-4.296	1.547
Panel B: Descriptive Statistics of the Variables used to Estimate the Relationship between Accounting Variables and the Cost of Capital					
Variables	No. of Observations	Mean	Std. Dev.	Minimum	Maximum
ICC_CT	851	0.2237	0.1471	0.012	0.981
ICC_MPEG	830	0.2253	0.1752	0.001	0.998
ICC_OJ	904	0.1277	0.0786	0.001	0.795
ICC_GLS	864	0.1725	0.2223	0.000	0.984
Average_ICC	905	0.1882	0.1326	0.001	0.999
Gr	1,359	1.0986	0.2037	0.410	3.140
AB	1,359	0.9350	3.6742	-8.420	38.830
FL	1,359	0.5120	0.1996	0.010	26.113
PV	1,359	0.3629	44.2351	-103.306	137.670
Nu	1,359	0.0058	0.1811	-4.960	0.820
Ct	1,359	0.7382	0.4397	0.000	1.000
FE	1,359	26.7540	20.939	2.564	100.000

Table-3. Pearson Correlation Matrices for Dependent and Independent Variables.

Variables	ICC_CT	ICC_MPEG	ICC_OJ	ICC_GLS	Average_ICC	Gr	AB	FL	PV	Nu	Ct	FE
ICC_CT	1.000											
ICC_MPEG	0.656	1.000										
ICC_OJ	0.565	0.455	1.000									
ICC_GLS	0.402	0.573	0.502	1.000								
Average_ICC	0.763	0.819	0.683	0.803	1.000							
Gr	0.060	-0.020	-0.029	0.037	0.017	1.000						
AB	0.132	0.158	0.117	0.174	0.181	-0.055	1.000					
FL	0.132	0.121	0.072	0.132	0.141	0.028	-0.058	1.000				
PV	0.205	0.131	0.332	0.195	0.225	0.087	-0.058	-0.038	1.000			
Nu	0.230	0.182	0.240	0.185	0.253	0.174	-0.032	-0.107	0.333	1.000		
Ct	0.259	0.200	0.321	0.188	0.261	0.056	0.031	0.006	0.172	0.234	1.000	
FE	-0.105	-0.151	-0.110	-0.212	-0.176	-0.078	0.153	0.018	0.016	-0.049	0.0307	1.000

Table 4 represents the OLS estimates of equation:

$$ICC_i = a_{0i} + b_1 Gr_i + b_2 AB_i + b_3 FL_i + b_4 PV_i + b_5 Nu_i + b_6 Ct_i + b_7 FE_i + e_i.$$

Table 4 shows that the coefficient of PV is positively significant for ICC_CT, ICC_OJ, ICC_GLS and average_ICC at 10%, 1%, 1% and 10% level, respectively. The beta coefficient of PV is found to be insignificant for ICC_MPEG only. As PV is inversely measured, this positive significance of the coefficient of PV shows that when accounting information has low PV then the cost of capital is high. We therefore accept our first hypothesis that states that the predictive value of accounting information has a significant impact on the cost of capital. This finding is consistent with Lambert et al. (2007) and Eliwa, Haslam, and Abraham (2016). These studies suggested that investors relate high PV to low information risk and that they reward low information risk with reduced cost of capital.

Table 4 shows that the coefficient of Nu is statistically positively significant for ICC_CT, ICC_MPEG, ICC_OJ, ICC_GLS and average_ICC at a level of 1%. This means that Nu (high value of accruals) has a positive significant impact on the cost of capital. We therefore accept our second hypothesis that states that the neutrality of accounting information has a significant impact on the cost of capital. These findings are similar to those of Lei (2013) and Houqe Hsieh et al. (2019). These studies suggest that a low amount of accruals—that is, neutral information—gives confidence to the investors about the reported numbers and thus reduces the cost of capital.

The coefficient of Ct is statistically positively significant for ICC_CT, ICC_MPEG, ICC_OJ, ICC_GLS and average_ICC at a level of 1%. This means that Ct has a positive significant impact on the cost of capital. This suggests that whenever the information is incomplete it reduces the confidence of investors and increases the cost of capital. We therefore accept our third hypothesis that states that completeness of accounting information has a significant impact on cost of capital.

The coefficient of FE is negatively significant for ICC_CT, ICC_MPEG, ICC_OJ, ICC_GLS and average_ICC. This suggests that error-free information has a negative impact on the cost of capital. We therefore accept our fourth hypothesis that states that error-free accounting information has a significant impact on the cost of capital.

Table-4. OLS Regression Estimates

Variables	(1) ICC_CT	(2) ICC_MPEG	(3) ICC_OJ	(4) ICC_GLS	(5) Average_ICC
Gr	-0.4797* (0.062)	-0.5572* (0.069)	-0.0507*** (0.000)	-0.0599 (0.113)	-0.0575*** (0.007)
AB	0.0417*** (0.001)	0.0574*** (0.000)	0.0178*** (0.005)	0.0721*** (0.000)	0.0470*** (0.000)
FL	0.1011*** (0.000)	0.1122*** (0.000)	0.0404*** (0.002)	0.1781*** (0.000)	0.1055*** (0.000)
PV	0.0224* (0.059)	0.0058 (0.685)	0.0195*** (0.001)	0.0050*** (0.004)	0.0018* (0.066)
Nu	0.1259*** (0.003)	0.1817*** (0.001)	0.0621*** (0.004)	0.2119*** (0.001)	0.1551*** (0.000)
Ct	0.0590*** (0.000)	0.0576*** (0.000)	0.0356*** (0.000)	0.0477*** (0.005)	0.0500*** (0.001)
FE	-0.0069*** (0.003)	-0.0013** (0.040)	-0.0055*** (0.000)	-0.0022** (0.020)	-0.0012*** (0.002)
Constant	0.2089*** (0.000)	0.2347*** (0.000)	0.1555*** (0.000)	0.1841*** (0.000)	0.2005*** (0.000)
R-Square	0.1201	0.1198	0.1559	0.1455	0.1743
F-stat	15.89*** (0.000)	15.26*** (0.000)	23.16*** (0.000)	20.47*** (0.000)	26.51*** (0.000)

Note: p-values are in parenthesis.
*** p<0.01, ** p<0.05, * p<0.1.

The control independent variables used in the OLS analysis include Gr, AB and FL. The coefficient of Gr is found to be negatively significant for ICC_CT and ICC_MPEG at a level of 10% and for ICC_OJ and average_ICC at a level of 1%. This shows that the growth of a firm has a negative impact on the cost of capital. The coefficient of AB and the coefficient of FL are found to be strongly positively significant for all four models of ICC and their average. This shows that an increase in AB and FL increases the cost of capital. The values of R-square for ICC_CT, ICC_MPEG, ICC_OJ, ICC_GLS and average_ICC are 12%, 11%, 15%, 14% and 17% respectively. F statistic is significant for all five estimated OLS regressions which reveals the fitness level of the model.

From the OLS estimates, we conclude that the qualitative attributes of accounting information of predictive value, neutrality, completeness, and free from error have a strong impact on the cost of capital.

We further analyzed these relationships to check that these are not created by chance, as Fama suggested in 1998. For this purpose, following Fama and French (1996) we examined risk-adjusted portfolio returns with the expectation that these returns vary in relation to specific risk factors. Risk-adjusted portfolios were formed on the basis of qualitative attributes of accounting information—that is, predictive value, neutrality, completeness and free from error. For portfolio formation on the basis of predictive value, each year stocks were allocated to three groups based on the breakpoints for the bottom 30%, middle 40% and top 30% of values of predictive value, representing P1, P2 and P3. These risk-adjusted portfolio returns show the returns by measuring how much risk is involved in producing this return. The same procedure was adopted for the portfolios (P1, P2 and P3) formation on the basis of neutrality and free from error. For completeness, only two portfolios (P1 and P2) were formed. P1 is the portfolio for which the variable has value of 1 and P2 is the portfolio for which the variable has 0 value. Monthly returns for portfolios (Rm) were computed from July 2013 to June 2020, using the monthly prices of stocks from the PSX. One-month Treasury bill rate (Rf) was deducted from the portfolio returns (Rm), to measure excess market return on portfolios (Rm – Rf). Table 5 shows the mean, standard deviation and one-sample t-test of the risk-adjusted portfolio returns. Null hypothesis for the one-sample t-test is that mean is equal to zero. T-test results for all the portfolios show that the mean of all the portfolios is greater than zero.

Table-5. Descriptive Statistics and One-Sample t-test ($H_0: \text{Mean} = 0$) of the Risk-Adjusted Portfolio Returns.

PV	Mean	Std. Dev.	t-test	Nu	Mean	Std. Dev.	t-test
P1	0.0311	0.0682	4.1802	P1	0.0331	0.0059	5.5555
P2	0.0315	0.0624	4.6267	P2	0.0275	0.0623	4.0526
P3	0.0326	0.0591	5.0493	P3	0.0371	0.0698	4.8820
Ct	Mean	Std. Dev.	t-test	FE	Mean	Std. Dev.	t-test
P1	0.0266	0.0602	4.0503	P1	0.0382	0.0786	4.4499
P2	0.0328	0.0602	4.9933	P2	0.0293	0.0525	5.1084
--	--	--	--	P3	0.0289	0.0653	4.0676

Panels A, B, C and D of Table 6 show the regression estimates of the CAPM for the risk-adjusted portfolios formed on the basis of PV, Nu, Ct and FE respectively. It is based on the idea that if markets are efficient then there is no way to systematically earn returns that exceed the market as a whole. The constant term is a measure of performance that indicates how an investor manages to beat the market returns over a particular period. Panel A of Table 7 shows constant terms are significant for all three portfolios. The value of the constant term for P1 is 0.019, for P2 it is 0.024 and for P3 it is 0.025. The pattern of increase shows that with the decrease in predictive value, risk-adjusted returns increase. Panel B of Table 7 shows that all three constant terms are significant. The value of the constant term for P1 is 0.026, for P2 it is 0.022 and for P3 it is 0.032. The pattern of risk-adjusted portfolio returns shows an upwards trend as it is 0.021 for P1 and 0.032 for P3. This pattern also shows that with an increase in accruals (low neutral value) the risk-adjusted returns increase.

Panel C shows that the constant terms for P1 and P2 are significant. The results demonstrate high risk-adjusted portfolio returns for the portfolio with the restatements or incomplete information. The constant terms

represented in Panel D are significant and show a pattern of systematic decrease. From all the estimates reported in Table 7 it is clear that the portfolios formed on the basis of qualitative attributes of accounting information show a systematic pattern in risk-adjusted returns. Thus it is concluded that these qualitative attributes are the real risk factors, and that they are not generated by chance due to inefficiency in the market.

Table-6. Systematic Pattern Analysis in Risk-Adjusted Portfolio Returns Using CAPM.

Panel A				Panel B			
PV	P1	P2	P3	Nu	P1	P2	P3
Rm-Rf (Market beta)	0.413*** (0.002)	0.449*** (0.001)	0.524*** (0.000)	Rm-Rf	0.339*** (0.000)	0.521*** (0.002)	0.559*** (0.000)
Constant	0.019*** (0.001)	0.024*** (0.004)	0.025*** (0.002)	Constant	0.026*** (0.000)	0.022*** (0.002)	0.032*** (0.001)
Observations	84	84	84	Observations	84	84	84
R-Square	0.091	0.192	0.281	R-Square	0.162	0.169	0.172
Panel C				Panel D			
Ct	P1	P2	--	FE	P1	P2	P3
Rm-Rf	0.410*** (0.001)	0.436*** (0.002)	--	Rm-Rf	0.392*** (0.000)	0.454*** (0.006)	0.547*** (0.005)
Constant	0.024*** (0.005)	0.019*** (0.004)	--	Constant	0.023*** (0.008)	0.020*** (0.005)	0.018*** (0.006)
Observations	84	84	--	Observations	84	84	84
R-Square	0.211	0.202	--	R-Square	0.112	0.141	0.225

Note: p-values are in parenthesis.
*** p<0.01, ** p<0.05, * p<0.1.

Table-7. Systematic Pattern Analysis in Risk-Adjusted Portfolio Returns Using Three-Factor-Model ($ER_i = a_i + b_{i1}(R_m - R_f) + b_{i2}(SMB) + b_{i3}(HML) + e_i$).

Panel A				Panel B			
PV	P1	P2	P3	Nu	P1	P2	P3
Rm-Rf	0.469*** (0.002)	0.465*** (0.007)	0.657*** (0.000)	Rm-Rf	0.548*** (0.005)	0.588*** (0.000)	0.685*** (0.008)
SMB	0.931*** (0.001)	0.821*** (0.000)	0.284*** (0.000)	SMB	0.414*** (0.004)	0.535*** (0.005)	0.874*** (0.000)
HML	-0.278 (0.254)	-0.024 (0.192)	-0.478** (0.042)	HML	-0.297 (0.250)	-0.358 (0.680)	-0.178 (0.541)
Constant	0.019*** (0.000)	0.021*** (0.000)	0.024*** (0.005)	Constant	0.026*** (0.000)	0.026*** (0.001)	0.033*** (0.004)
Observations	84	84	84	Observations	84	84	84
R-Square	0.401	0.423	0.387	R-Square	0.320	0.445	0.468
Panel C				Panel D			
Ct	P1	P2	--	FE	P1	P2	P3
Rm-Rf	0.648*** (0.007)	0.612*** (0.006)	--	Rm-Rf	0.432*** (0.000)	0.497*** (0.001)	0.536*** (0.005)
SMB	0.542*** (0.000)	0.671*** (0.000)	--	SMB	1.012*** (0.000)	0.654*** (0.000)	0.387** (0.004)
HML	-0.125 (0.168)	-0.235 (0.142)	--	HML	-0.237 (0.224)	-0.274 (0.181)	-0.212 (0.245)
Constant	0.027*** (0.001)	0.021*** (0.000)	--	Constant	0.031*** (0.000)	0.020*** (0.001)	0.016*** (0.008)
Observations	84	84	--	Observations	84	84	84
R-Square	0.422	0.465	--	R-Square	0.474	0.358	0.364

Note: p-values are in parenthesis
*** p<0.01, ** p<0.05, * p<0.1.

Panels A, B, C and D of Table 7 show the estimates of the three-factor model for the risk-adjusted portfolios formed on the basis of PV, Nu, Ct and FE respectively. P1, P2 and P3 show low, medium and high portfolios respectively. The procedure of SMB (small minus big) and HML (high minus low) factors' formation was as follows. First of all, stocks were sorted on the basis of their market cap: 50% of the market cap was used as the breakpoint

for size that defines small-sized and big-sized stocks. For sorting on the basis of value, the 30th and 70th percentile were used as breakpoints. Then the stocks in the sample were independently distributed for each year into six size-B/M (book-to-market ratio) portfolios. All the portfolios were value-weighted according to their market cap. Monthly returns were calculated for all of these six portfolios. After this actual factor (SMB and HML) returns were calculated.

Labeling was done in the size group as: small (S), or big (B) and the B/M group, high (H), neutral (N), or low (L). Factor returns were calculated as:

$$\text{SMB}_{B/M} = (\text{SH} + \text{SN} + \text{SL})/3 - (\text{BH} + \text{BN} + \text{BL})/3$$

$$\text{HML} = (\text{SH} + \text{BH})/2 - (\text{SL} + \text{BL})/2$$

Table 7 shows that constant term for all the portfolios in Panels A, B, C and D are significant. For PV and Nu constant terms are showing a pattern of increase. Portfolios formed on the basis of Ct are also showing risk-adjusted portfolio returns to be higher for the portfolio that represents restated financial reports. Portfolios formed on the basis of FE also show a systematic pattern.

The systematic pattern in the constant terms shows that with an increase in risk factors risk-adjusted portfolio returns also increase. This analysis demonstrates that the qualitative attributes of accounting information create real risk and are priced into the equity market of Pakistan.

5. CONCLUSION AND RECOMMENDATIONS

This study aimed to determine the impact of the quality of accounting information on the cost of capital in the firms listed on the Pakistan Stock Exchange (PSX). For this purpose, the qualitative attributes of accounting information outlined in SFAC No. 8 were analyzed. The fundamental qualitative attributes as per SFAC No. 8 comprise relevance and representational faithfulness. Relevance refers to predictive value or confirmatory value, and representational faithfulness refers to the accounting information's attributes of neutrality, completeness and free from error. The cost of capital was estimated using four different models of the ICC.

Findings revealed that the accounting information attributes of predictive value, neutrality, completeness and free from error do impact the cost of capital in the equity market of Pakistan. This suggests that these attributes create risk and investors should evaluate them while making their investment decisions. Risk-adjusted returns for portfolios formed on the basis of qualitative attributes of accounting information were examined using the CAPM and Fama–French three-factor model. The results revealed a systematic pattern in risk-adjusted portfolio returns. This demonstrated that the relationship between the qualitative attributes of accounting information and the cost of capital was not due to the inefficiency of the market at a particular time, but rather the qualitative attributes are genuine risk factors. Based on the findings of this study, the following recommendations are proposed. First, the quality of accounting information should be analyzed precisely so that investors can manage their portfolios effectively. Failure to analyze properly the impact of these factors will lead to poor decisions regarding investment and portfolio management. Second, stock analysts should evaluate these factors when assessing the performance of quoted stocks in order to provide prudent equity recommendations to investors. Third, SECP must ensure there is transparency in the stock market because greater transparency in the trading in the PSX will attract more investments and help to develop the market. Fourth, ICAP (The Institute of Chartered Accountants of Pakistan) and SECP both should take steps to allow the adoption of SFACs in Pakistan. The reporting quality should be made a required element of all audit investigations.

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