A Study of the Relationship between the Qualitative Characteristics of Accounting Earnings and Stock Return

by

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The thesis is submitted for the fulfilment of the requirements for the degree of the doctor of philosophy in accounting and finance

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September 2011

Declaration

I hereby declare that this thesis has not been submitted in whole or in part to another university for the award of any other degree.

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Abstract

The main purpose of this thesis is to test whether the quality of earnings improves the usefulness of accounting information in the decision making process. This is particularly important because the Financial Accounting Standard Board (FASB) considers the usefulness of accounting information as the primary objective of financial statements (FASB, 1978). To achieve this purpose, the thesis examines two interrelated subjects. The first subject of the study "*The Qualitative Characteristics of Accounting Earnings and Stock Return*" (Chapter 3) assesses the impact of earnings quality on stock returns as a representative for the usefulness of earnings information. The research also attempts to extend the concept of earnings quality and its constructs based on the primary qualitative characteristics of accounting information from the FASB's viewpoint. Therefore, the study defines earnings quality as the extent to which reported earnings capture both dimensions of the qualitative characteristics of accounting information, relevance and reliability. Eight earnings quality attributes are characterized as either 'relevance-based' or 'reliability-based' to capture earnings information quality. Moreover, associations between earnings quality attributes and stock returns are considered to test whether earnings quality information is reflected in the investors' decision-making process. The result indicates that all earnings quality attributes but one are associated with the returns of stock in the predicted way; the exception is conservatism. This finding suggests that the earnings quality attributes make accounting information useful for decision making, which is consistent with the FASB's assertion. In addition, comparisons of incremental explanatory power show that relevance-based earnings quality attributes explain

more of the stock returns variation than do reliability-based earnings quality attributes.

The second subject of this thesis, *"The Effect of Earnings Quality on the Value-Relevance of Accounting Information"* (Chapter 4), aims to link earnings quality constructs with the equity valuation model by assessing their effect on the relative desirability between the value-relevance of earnings and book value of equity. In this respect, the study investigates whether earnings quality constructs, systematized in the first topic of this study, are reflected in the equity valuation process. This is an important issue, as the incorporation of earnings quality attributes into equity valuation models may provide more realistic estimates of firm's value. The study conducts factor analysis on eight earnings quality attributes to construct an index of each earnings quality dimension for each firm-year. The results indicate that in portfolios of firms with high quality earnings (HH), the value-relevance of earnings and book value are respectively higher and lower than in portfolios of firms with low quality earnings (LL). Moreover, the study finds that the ability of earnings and book value jointly to explain stock price is significantly higher in firms with high quality earnings information compared to firms with low quality earnings information. This finding confirms that earnings quality constructs provide relevant information in the valuation process.

Investigation of relative preference between relevance and reliability shows that investors in equity valuation prefer more relevance than reliability in the earnings information. This finding highlights the importance of relevance-based

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Acknowledgements

This thesis would not have been possible without the support of many people and organizations. First and foremost, I would like to express my heartfelt gratitude to my principal supervisor, Dr. Wei Pang for her supervision, encouragement, and patience throughout the course of my PhD study. This thesis could not be successfully completed without her continuous guidance and invaluable support. I am greatly indebted to my two associate supervisors, Professor Vincent Daly and Dr. Hong Li, for their support, guidance, and encouragement during all stages of the research. I am grateful to Dr. Christian Richter for his helpful comments on my empirical work.

This thesis has also benefited from the helpful suggestions of participants at The British Accounting and Finance Association (BAFA) Annual Conference (April 2011, Aston University), The 34th Annual Congress of the European Accounting Association (April 2011, University of Siena and University of Rome), Economics Research Students' Conference (June 2010 and 2011, Kingston University London), The International Conference on Business and Finance Sciences (January 2011, Dubai, United Arab Emirates) and The First Workshop and Annual Student Conference (Azad University in Oxford February 2010). I would also like to thanks my sponsor, Azad University, Tabriz Branch for their support.

Last but not least, I am deeply thankful for my family for their patience and encouragement, specifically my wife and my daughter who have shared this dream with me.

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Publications from the Thesis

The following publications are based on certain parts of the thesis:

Journal Article:

'Earnings Quality Constructs and Measures', *Journal of the Business Review, Cambridge, December 2010,* 16(1), pp.277-283.

Conference Papers:

'The Qualitative Characteristics of Accounting Earnings and Stock Returns', *The British Accounting and Finance Association (BAFA) Annual Conference, Birmingham, UK, 12-14 April 2011.*

'Earnings Quality Constructs Derived from the FASB'S Qualitative Characteritics' *The 34th Annual Congress of the European Accounting Association (EAA) in Rome, Italy, 20-22 April 2011.*

'A Review of Earnings Quality', *The American Accounting Association (AAA), International Accounting Section Mid-Year Conference in Tampa, Florida, 27-29 January 2011.*

'Relevance-based Earnings Quality Attributes And Stock Returns', *International Conference on Business and Finance Sciences, Dubai, United Arab Emirates, 25-27 January 2011.*

'A Study of the Relationship between the Qualitative Characteristics of Accounting Earnings and Stock Return in TSE', *Workshop & Annual Postgraduate Student Conference on Meeting the Doctoral Thesis Challenges, Azad University (IR) in Oxford, 23-24 February 2010.*

'The Effect of Earnings Quality on the Value-Relevance of Accounting Information', *American Accounting Association (AAA) Annual Meeting in Denver, USA, 6-10 August 2011.*

'Relative Importance for Relevance or Reliability of Earnings Information', *Annual Postgraduate Student Conference, Azad University (IR) in Oxford, 29 July 2011.*

Working Paper:

'Earnings Quality Constructs and Measures', Working Paper SSRN, June 2010. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1678461

Chapter 1

An Overview of the Thesis

1.1 Introduction

The usefulness of financial statements is a continuous topic in accounting research. Particularly, the usefulness of earnings information is of major importance to accounting researchers, practitioners and policy makers since "earnings are widely believed to be the premier information item provided in financial statements" (Lev 1989, p. 155). Nevertheless, the importance of earnings is emphasized by the Financial Accounting Standard Board (hereafter FASB) in considering earnings information and its components as the primary focus of financial statements (FASB 1978, SFAC[1] No. 1).

In accounting literature, the usefulness of earnings is often discussed from the perspective of value-relevance. Value-relevance of accounting information is considered as the degree to which accounting figures have a predicted association with stock market value (Holthausen and Watts, 2001). Particularly, value-relevance reflects the consequences of the market's reaction to accounting information. Prior studies (e.g., Ball and Brown 1968; Lev 1989; Lev and Zarowin 1999; Vafeas 2000; Barth et al. 2001) suggest that earnings information will be reflected in the market value of equity when the information is useful to investors. Since associations between earnings and stock prices or returns reflect the consequences of investors' actions, these studies use earnings-return

[1]Statement of Financial Accounting Concepts

association to evaluate the usefulness of accounting information. They provide evidence suggesting the decline in the usefulness of earnings information.

The value-relevance of earnings is based on the premise that, if reported earnings provide useful information, investors will modify their behaviour and the stock market will react through effects on the market value of equity. However, earnings-return or price association might be expected to vary, depending on the quality of earnings information. Specifically, when the quality of earnings information declines, investors may place less reliance on accounting earnings in the decision making process.

In line with the above views, the quality of earnings information plays an important role in the usefulness of earnings information for financial decision-making. It is an important subject today because of the reliance of stock markets on credible accounting information, specifically the income statement. However, earnings quality have been a topic of increasing importance and interest especially after the colossal corporate collapses of Enron and WorldCom amongst others in the early 2000s, which have put a big question mark over earnings quality of the publicly listed companies in the stock market[2] (Giroux, 2004).

Earnings quality is a multidimensional concept and there is no unified definition in accounting literature. Most of the studies differ in their views about the meaning of the term 'earnings quality'. Schipper and Vincent (2003) view

[2]The decline in stock markets in the early 2000s has been attributed to the lack financial information quality. Particularly, earnings quality becomes questionable due to the manipulation of earnings in the colossal firms such as Enron, Worldcom etc.

earnings quality in relation to Hicksian income.[3] They define earnings quality as "the extent to which reported earnings faithfully represent Hicksian income, including the change in net economic assets other than transactions with owners". For Kirschenheiter and Melumad (2004), earnings are of higher quality when they are more informative and closer to the long run value of the firm. The FASB specifies the quality of financial information from the perspective of usefulness to the users in decision making which primarily depends on the relevance and reliability of accounting information.

Due to various definitions of earnings quality, accounting literature includes a variety of earnings quality measures including accruals quality, abnormal accruals, predictability, the persistence of earnings, smoothness of earning, and the conservatism in reported earnings. Most studies have evaluated earnings quality by focusing just on one dimension of the qualitative characteristics of accounting information (e.g., Barth et al., 2001; Dechow and Dichev, 2002; Penman and Zhang, 2002; Beneish and Vargus, 2002; Leuz et al., 2003; Cohen, 2004; Revsine et al., 2008). These studies do not measure all earnings quality information in their research since earnings quality attributes used in these investigations assess just one aspect of earnings quality. Consequently, accounting literature may present an incomplete picture of the impact of earnings quality on the value-relevance of accounting information in the valuation of equity.

[3]Schipper and Vincent (2003, p.97) consider Hicksian income "as the amount that can be consumed (that is, paid out as dividends) during a period, while leaving the firm equally well off at the beginning and the end of the period".

In line with the FASB's Conceptual Framework, the focus of the present study is on the usefulness of earnings information from the investors' viewpoint, as they are the main users of financial statements. The study considers decision usefulness "as the extent to which accounting numbers reflect information used by investors in valuing firm's equity" (Barua, 2006, p.2).

The remainder of the chapter is structured as follows: section 1.2 outlines the purpose of the study and provides a more detailed discussion of the intended motivation. Section 1.3 explains the methodology of the thesis. Section 1.4 Summarizes main finding of the study. Section 1.5 provides an overview of the structure of the thesis.

1.2 Motivation and Purpose of the Thesis

This study is motivated by the FASB's Conceptual Framework which states that the primary purpose of financial reporting is to "provide information that is useful to present and potential investors and creditors and other users in making rational investment, credit, and similar decisions" (SFAC No. 1, FASB 1978, par. 34)[4]. The main purpose of the study is to test whether the quality of earnings improves the usefulness of accounting information in the decision making process.

To achieve the purpose of the study two interrelated subjects are examined.

[4]Conceptual frameworks of Accounting Standard Board (ASB), Theoretical Concepts of Financial Reporting in Iran and International Accounting Standard Board (IASB) also point to the usefulness of accounting information as the primary objective of financial statements.

The first area of the study "*The Qualitative Characteristics of Accounting Earnings and Stock Return*" (Chapter 3), assesses the impact of earnings quality on stock returns as a representative for the usefulness of accounting earnings. The study aims to test whether the earnings quality construct is reflected in investors' decision making. This study also attempts to extend the concept of earnings quality and its constructs based on the primary qualities of accounting information. Additionally, the research investigates the relative strength of relevance-based versus reliability-based attributes in making earnings information useful for decision making.

The FASB points to the usefulness of accounting information as the benchmark for assessing accounting information quality. The SFAC No.2, (*Qualitative Characteristics of Accounting Information*, expresses that "the primary qualities of accounting information are relevance and reliability, and that to be useful; information must possess both of those qualities" (FASB, 1980).

Although various earnings quality concepts and metrics are frequently used in the literature, there is no consensus on the measurement of earnings quality. The accounting literature provides several concerns about using each measure as a proxy for the quality of earnings. One important criticism is that each attribute of earnings quality assesses a single element of relevance or reliability of earnings information. As a result, focusing on a single measure may not capture all information about earnings quality. To mitigate this problem and achieve a comprehensive measure of earnings quality, the current study extends the concept

of earnings quality by considering the quality of accounting information from the FASB viewpoint.

This study defines earning quality as the extent to which reported earnings capture both dimensions of the qualitative characteristics of accounting information, relevance and reliability. This definition encompasses different aspects of the earnings quality concept, because it takes into account both primary determining factors of earnings quality, relevance and reliability, as specified in the FASB's conceptual framework.

A review of the literature indicates that some studies demonstrate the relative priority of accounting earnings over other accounting figures in predicting stock returns (Wilson 1986; Beaver and Dukes 1972; Dechow 1994). These studies usually consider quantity of earning and ignore its quality in their analyses. Moreover, studies on return and earnings quality association have measured earnings quality by abnormal accruals (Khajavi and Nazemi, 2005; Chan et al., 2006; Panahian and Ramezani, 2008; Ghaemi et al., 2008). In fact, abnormal accruals actually measure earnings management which is just one of the earnings quality aspects. Particularly, studies on the Tehran Stock Exchange (Khajavi and Nazemi, 2005; Ghaemi et al., 2008) have documented some different results due to the use of alternative methods for measuring abnormal accruals. Therefore, the accounting literature may provide an incomplete picture of the effect of earnings quality on the behaviour of stock returns. In this respect, this study examines whether the qualitative characteristics of accounting earnings are associated with the returns of stock. It is expected that earnings quality reduces the level of risk

and investors' expected return rate. Indeed, if investors correctly price earnings quality, it affects stock price and returns. Thus, the study hypothesizes that stock return is positively associated with the qualitative characteristics of accounting earnings.

An analysis of the relative importance for relevance or reliability of earnings information is important in the evaluation of accounting standards and selection of accounting alternatives. The FASB Conceptual Framework (SFAC No.2, para.42) expresses that "although financial information must be both relevant and reliable to be useful, information may possess both characteristics to varying degrees". Further, the SFAC No.2, para.90 mentions that "reliability and relevance often impinge on each other". However, the information will not be useful, if either of two primary qualitative characteristics is completely missing. Barua (2006) finds that reaction of investors is higher to relevance than reliability of earnings information. Prior studies in an Iranian context do not provide any empirical evidence in this regard. Therefore, this study attempts to explore the relative desirability for relevance or reliability in decision making. The study examines whether investors prefer one dimension of earnings qualitative characteristics to the other in investment decisions.

To increase the reliability of the empirical results, this study considers a comprehensive and systematic assessment of earnings quality by operationalising the primary qualitative characteristics of accounting information, relevance and reliability. According to SFAC No.2 (FASB 1980), "to be relevant, information must be timely and it must have predictive value or feedback value or both. To be

reliable, information must have representational faithfulness and it must be verifiable and neutral". Therefore, the study considers the eight earnings quality attributes as either 'relevance-based' or 'reliability-based'. Predictive value, feedback value, persistence, and timeliness, which measure relevance of earnings information, are considered as relevance-based. Abnormal accruals, smoothness of earnings, conservatism and accruals quality, which measure reliability of earnings information, are referred to as reliability-based.

The second area of this study, *"The Effect of Earnings Quality on the Value-Relevance of Accounting Information"* (Chapter 4), aims to link earnings quality constructs with the equity valuation model by assessing their effect on the relative desirability between the value-relevance of earnings and book value of equity. In this respect, the study investigates whether earnings quality constructs, systematized in the first area of this study, are reflected in the equity valuation process. This is an important issue, as the incorporation of earnings quality attributes into equity valuation models may provide more realistic estimates of firm's value.

This study investigates the role of earnings quality in three interrelated issues in the value-relevance literature; (i) the shift of value-relevance from accounting earnings to book value of equity (e.g., Barth et al., 1998; Collins et al., 1999; Ou and Sepe, 2002); (ii) the offset of the decline in the value-relevance of earnings by the increase in the value-relevance of book value (e.g., Collins et al., 1997; Barth et al., 1998; Francis and Schipper, 1999; Whelan and McNamara, 2004); and (iii) changes in the value-relevance of accounting information over time(e.g., Francis

and Schipper, 1999; Lev and Zarowin, 1999; Marquardt and Wiedman, 2004; Thinggaarda and Damkierb, 2008).

The first of these is concerned with the role of earnings quality in the shift of market's reliance from earnings to book value in the equity valuation process. The study questions whether investors can differentiate between portfolios of firms with high and low quality earnings leading to differential market reactions. The premise is that if investors can differentiate, then high quality earnings will lead to a larger market reaction to earnings.

The market's anticipation of firm performance is reflected in the market value of equity. Both earnings and book value provide accounting information which is required in the valuation process. Earnings information is a core measure of current performance as well as a reliable indicator of future performance and book value of equity is a representative of past performance. Therefore, these criteria have been used by previous studies, as the basis for evaluation of a firm's equity in the accounting literature (e.g., Dechow, 1994; Ohlson, 1995; Penman, 1998; Whelan and McNamara, 2004).

Prior studies (e.g., Wilson, 1986; Beaver and Dukes, 1972; Dechow, 1994) document the relative superiority of earnings value-relevance over other accounting numbers. However, investors may decide to look for other alternative accounting information as the basis for valuation purposes when they perceive a decrease in the quality of earnings. Some studies on the relative value-relevance of earnings and book value of equity find that the market reliance shifts from

accounting earnings to book value of equity in the equity valuation process (Barth et al., 1998; Collins et al., 1999; Ou and Sepe, 2002).

The studies on value-relevance have documented that the causes of the shift in market reliance from earnings to equity book value are mainly due to an increase in the occurrence of reported losses (Hayn, 1995) and the extent of abnormal and extraordinary items (Elliott and Hanna, 1996), as well as a decrease in firm size (Wild, 1992). However, these studies often take quantity of earnings and ignore its quality in their analyses. Chan et al. (2006, p.1042) express that "in the context of stock prices, to the extent that the market fixates on reported income and does not take into account the quality of firms' earnings, there may be temporary deviations of prices away from their correct values". In fact, value-relevance of earnings is expected to vary, depending on whether the earnings surprise reflects an earnings manipulation by managers or real improvement in profitability.

A review of the literature indicates that a few studies have investigated the effect of persistence of earnings, as a measure of earnings quality, on the value-relevance of accounting information (Jeon et al., 2004; Steven et al., 2009). Particularly, these studies, by focusing on one aspect of earnings quality, do not measure all earnings quality information and its effect on the value-relevance of accounting information in their empirical research. As a result, there is an important gap in the value-relevance literature relating to the impact of earnings quality on the relative value-relevance of accounting figures.

Since higher quality earnings better capture a firm's underlying economic performance, they should be more useful in helping investors assess firm value.

Thus, the study supposes that, a higher quality of earnings contributes to improving the reliability and relevance of earnings information, thereby increasing the value-relevance of earnings in valuing a firm's equity. When earnings are perceived to be relevant and reliable (high earnings quality), this may lead to a decline in market's focus on book value as the basis for valuation purposes. Accordingly, earnings quality may have a negative effect on the value-relevance of book value in equity valuation.

The second issue of the study is concerned about the offset of the decline in the value-relevance of earnings by the increase in value-relevance of book value which is documented by previous studies (e.g., Berger et al., 1996; Burgstahler and Dichev, 1997; Collins et al., 1997; Barth et al., 1998; Francis and Schipper, 1999; Whelan and McNamara, 2004). These studies do not consider the quality of earnings in their analyses. However, value-relevance of accounting information can be expected to vary in portfolios of firms with low quality earning compared to firms with high quality earning. Accordingly, the present study classifies observation (firm-years) into four portfolios according to the level of their earnings quality. Then, it examines whether the increase in the value-relevance of book value in portfolios of firms with low quality earnings could be offset the decline in the value-relevance of earnings.

The third issue of the study investigates the recent evidence, which suggests that the value-relevance of accounting information has declined over time. (Francis and Schipper, 1999; Ely and Waymire, 1999; Lev and Zarowin, 1999; Graham et al., 2000; Ho et al., 2001; Core et al., 2003; Marquardt and Wiedman,

2004; Thinggaarda and Damkierb, 2008). Collins et al. (1997) state that "recent research suggests at least four factors that are likely to contribute to changes in the value-relevance of earnings and book values over time: (1) the increased importance of service and technology based firms that invest in intangibles; (2) the frequency and magnitude of nonrecurring items; (3) the incidence of negative earnings; and (4) the growing number of small firms". This study attempts to provide some insights into the role of earnings quality in the trend of value-relevance over time. Specifically, the study examines whether changes in the value-relevance of accounting information over time may be explained by the changes in the quality of earnings.

1.3 Methodology

The study sample includes firms listed on the Tehran Stock Exchange based on annual observations over the period from 2000 to 2008. The required data consists of accounting data (audited financial statements) and market data (stock price). In analysing collected data, the pooled data regression method was applied. To strengthen the reliability of the results, the regression models are estimated by applying a fixed-effects approach.

The first area of the study hypothesizes that stock return is positively associated with the qualitative characteristics of accounting earnings. The supposition is tested by the development of three sets of hypotheses. The first set of hypotheses relates to test association between stock return and relevance-based earnings quality attributes. The second set of hypotheses is applied to examine the relationship between stock returns and reliability-based earnings quality attributes.

Finally, the relative importance of relevance-based or reliability-based of earnings quality attributes is tested by set of Hypotheses 3.

To test the hypotheses three OLS regression models are used. Models 1 and 2 are considered to measure effects of relevance-based and reliability-based earnings quality attributes respectively on stock returns. Model 3 encompasses all earnings quality attributes. It is used to assess the incremental contribution of each attribute, in the presence of the others, to explain stock returns. Meanwhile, a number of factors which affect stock returns, including firm's size, book to market equity ratio, and systematic risk (beta) are also taken into account in the models.

The relationship between earnings quality and stock returns is assessed by the significant coefficients of earnings quality attributes, both individually and jointly, in a regression against stock returns. To investigate the relative preference of relevance-based versus reliability-based attributes, the study compares the incremental explanatory power of the relevance-based attributes with of the reliability-based attributes.

In the second area of the study, the supposition is tested by the expansion of three sets of hypotheses. The first set of hypotheses relates to the comparison of value-relevance of earnings and book value between two portfolios of firms with high relevance & high reliability (HH) and low relevance & low reliability (LL). The relative importance of relevance or reliability of accounting information in the valuation process is tested by set of Hypotheses 2 which compares value-relevance of earnings and book value between two portfolios of firms with high relevance & low reliability (HL) and low relevance & high reliability (LH).

Finally, the set of Hypotheses 3 relates to the comparison of the value-relevance of earnings between four portfolios (HL and LH with HH and LL).

The study uses eight earnings quality attributes, systematized in the first area of the study, and conducts factor analysis to construct an index of each earnings quality dimension for each firm-year, by aggregating the common information across the different measures. Earnings attributes representing predictive value, feedback value, persistence, and timeliness are loaded in factor 1, as the *Relevance* factor, and variables representing abnormal accruals, conservatism, smoothness of earnings and accruals quality are loaded in factor 2, as the *Reliability* factor. Subsequently, factor scores are obtained for each factor, which present the summary measures of each earnings quality dimension, relevance and reliability. Then, by using high and low scores, observations are classified into four portfolios: (1) high relevance and high reliability (HH); (2) low relevance and low reliability (LL); (3) high relevance and low reliability (HL); and (4) low relevance and high reliability (LH).

To investigate the influence of earnings quality on the value-relevance of accounting information, the study uses a valuation model provided by Ohlson (1995). This model considers stock price as a function of both accounting earnings and equity book value. The responses coefficients on the earnings and book value interaction variables and adjusted R^2 from valuation model are used as the primary metrics for measuring value-relevance. To compare the explanatory power of earnings and book value, the combined explanatory power of earnings and book value of equity is disaggregated, using a technique described by Theil

(1971), into three components: "(i) the incremental explanatory power of earnings; (ii) the incremental explanatory power of book values; and (iii) the explanatory power common to both earnings and book values" (Collins et al., 1997, p.40-41).

Earnings quality is introduced to the model through the inclusion of slope dummies interacting with earnings and book value of equity. Each dummy variable has a value of 1 if a firm-year observation is placed in the relevant portfolio (HH, LL, HL or LH), and 0 otherwise. The dummy variables assist in evaluating the effect of earnings quality on the value-relevance of earnings and book value.

To strengthen the reliability of the results, the valuation model is separately re-estimated for each portfolio. Moreover, the hypotheses are re-tested by including size, leverage, Tobin's Q, systematic risk (beta), operating cycle (OPCYC), growth, and negative earnings (NEPS), as control variables, in the valuation model.

1.4 Main Findings

In regard to stock returns and earnings quality association (Chapter 3), the results indicate that earnings quality is positively associated with stock returns. These findings provide empirical evidence suggesting that the quality attributes of earnings enhance the usefulness of accounting information for investors in decision making. Moreover, an examination of market desirability for relevance or reliability of earnings information shows that relevance-based attributes explain more of the stock returns variation than do reliability-based attributes. This

finding specifies that investors in the decision making process prefer more relevance than reliability related earnings information. Additionally, the results suggest that, among relevance-based attributes, persistence of earnings, and among the reliability-based attributes, accruals quality have the largest effects on stock returns.

The study also reveals that stock returns are negatively related to a firm's size, and positively related to both book-to-market equity ratio (BM) and systematic risk (beta). In addition, the results of assessing a base model that comprises only the control variables provide a validation of the model used for stock returns estimates.

In respect to the effect of earnings quality on the value-relevance of accounting information (Chapter 4), the results illustrate that in portfolios of firms with high quality earnings (HH), the value-relevance of earnings and book value are respectively higher and lower than in portfolios of firms with low quality earnings (LL). This finding confirms that earnings quality constructs provide relevant information in the valuation process. Moreover, investigation of relative preference between relevance and reliability shows that investors in equity valuation prefer more relevance than reliability in the earnings information which is consistent with the findings in the first part of the study. This finding highlights the importance of relevance-based earnings quality attributes in improving the usefulness of earnings information in valuing a firm's equity. Further, this result provides evidence that the market may not be able to distinguish reliability of earnings information.

The results also confirm that the ability of earnings and book value jointly to explain stock price is significantly higher in firms with high quality earnings information compared to firms with low quality earnings information. This provides empirical evidence suggesting that the increase in the value-relevance of book value in the LL portfolio may not exactly offset the decline in the value-relevance of accounting earnings. It results in a decline of the value-relevance of accounting information.

Trends analysis of value-relevance and earnings quality over time reveals that there is a significant decrease in the combined value-relevance of earnings and book value over the study period. Further analysis, decomposition of combined explanatory power, indicates that the value-relevance of earnings has decreased while value-relevance of book value has remained relatively constant over time. The result for earnings quality shows that relevance of earnings information declines whereas the reliability of earnings information is unchanged. These results confirm that a decline in value-relevance of earnings over time can be explained by the decreasing significance of relevance-based earnings quality attributes. This contributes to the value-relevance literature on the role of earnings quality in changing the value-relevance of earnings over time.

The study also included two robustness tests. First, control variables were used for firm size, leverage, Tobin's Q, systematic risk (beta), operating cycle (OPCYC), growth, and negative earnings (NEPS) which are known as effective factors on the relative value-relevance of earnings and book value of equity. After the inclusion of these factors in the model, the results were consistently

confirmed. Furthermore, the results specify that all control variables are associated with the value-relevance variation of earnings and book value. In addition to this, the shift in value-relevance from earnings to book values may explain by firm size and operating cycle (OPCYC). Second, the study disaggregated the combined explanatory power of earnings and book value of equity using a technique described in Theil (1971). Then, it used explanatory power of earning and book value as an alternative measure of value-relevance.

Finally, this study provides empirical evidence suggesting that earnings quality increases the market's reaction to accounting information. This provides a further validation of the earnings quality constructs base on the qualitative characteristics of accounting information. Further, the results confirm that the quality of earnings information is reflected in investors' decision making by enhancing the usefulness of earnings information, which is consistent with the FASB's assertion.

1.5 Structure of the Thesis

The reminder of the thesis is organised as follows:

Chapter 2: Literature Review

This chapter presents an overview of the recent studies on earnings quality and its relationship with stock returns as well as value-relevance of accounting information. The chapter also provides more details about the concept of earnings quality, the qualitative characteristics of accounting information, and earnings quality constructs.

Chapter 3: The Qualitative Characteristics of Accounting Earnings and Stock Return

This chapter considers associations between earnings quality attributes and stock return to test whether the quality of earnings is reflected in investors' decision-making. The chapter examines whether the qualitative characteristics of accounting earnings are associated with stock returns. It hypothesizes that stock return is positively associated with the qualitative characteristics of accounting earnings. Additionally, the research aims to investigate the relative strength of relevance-based versus reliability-based attributes in improving the usefulness of earnings information for decision-making.

The chapter is structured as follows: Section 1 introduces the study. Section 2 explains the background of the study and develops the research hypotheses. Section 3 describes earnings quality constructs and measures. Section 4 explains the process of sample selection, research design, and methodology. Section 5 presents empirical results. Section 6 concludes the study.

Chapter 4: The Effect of Earnings Quality on the Value-Relevance of Accounting Information

This chapter links earnings quality with equity valuation model by assessing its effect on the value-relevance of accounting information. In this respect, it investigates whether the qualitative characteristics of accounting earnings, constructed in chapter 3, influence the value-relevance of accounting numbers. It focuses on the quality of earnings in assessing the relative desirability between the value-relevance of earnings and book value. Moreover, the study compares the

incremental explanatory power of earnings and book values and examines the relative preference between relevance and reliability of earnings information in the equity valuation process.

The chapter is organised as follows: Section 1 introduces the study. Section 2 explains the background of study and develops the research hypotheses. Section 3 describes research design and methodology. Section 4 provides empirical results. Section 5 concludes the study.

Chapter 5: Summary and Conclusions

The final chapter summarises the main findings of the thesis and concludes it. The chapter outlines the contributions of the thesis to the literature, the implications of the study, and limitations of the study. In addition, the chapter provides some suggestions about future research in this area.

Chapter 2

Literature Review

2.1 Introduction

The assumption that earning is a premier source of firm-specific information is supported by empirical studies (Biddle et al. 1995; Francis et al. 2003; Liu and Wysocki 2007) which indicates that investors rely on earnings in decision making more than any other summary measure of performance (i.e., dividends, cash flows). Thus, the quality of earnings information is of major importance to the financial information users since earnings are considered as a key factor in determining the dividend policy, a guideline for investment decision-making, a core measure of a firm's performance, an effective criterion in the stock pricing and eventually an instrument utilized to make predictions (Wilson 1986; Beaver and Dukes 1972; Dechow 1994).

Since earnings constitute a premier source of firm-specific information, earnings quality is considered a main part of financial statements quality (Francis et al. 2004, p. 968). The quality of earning plays an important role in the usefulness of earnings in decision making process and is an important subject today because financial decisions in capital markets are based on credible financial statements specifically the income statement. However, earnings quality has been a topic of increasing importance and interest particularly, after the wave

of accounting scandals[5]. The decline in the international stock markets in the early 2000s has been attributed to the lack of financial information quality which has placed a large question mark over the financial reporting quality, specifically earnings quality of the publicly listed companies in the stock market. Investors and shareholders have become concerned about accuracy of financial statements and less usefulness of earnings information.

Francis et al. (2004) argue that earnings quality is used by investors "as a conditioning variable to extract valuation-relevant information from earnings patterns." Schipper and Vincent (2003, p.98-99) express the importance of earnings quality as follows:

"From a financial information user's perspective, earnings and metrics derived from them are commonly used in compensation arrangements and in debt agreements. For example, overstated earnings, used as the indicator of managers' performance, will result in overcompensation to managers. Similarly, overstated earnings might mask deteriorating solvency, leading lenders mistakenly to continue lending or to defer foreclosure.

From an investment perspective, low-quality earnings are undesirable because they provide a defective resource allocation signal. Low-quality earnings are inefficient because they reduce economic growth by causing capital to be misallocated.

[5] The manipulation of accounting figures by the colossal corporate collapses of Enron and WorldCom amongst others in the early 2000s,

From an accounting standard setting perspective, accounting standard setters seek feedback on whether the standards they promulgate are effective, they tend to focus on outputs, including reporting earnings. The FASB's[6] Conceptual Framework points to decision usefulness as the benchmark for assessing effectiveness".[7]

This chapter provides an overview of the recent studies on earnings quality and its relationship with stock returns as well as value-relevance of accounting information. The rest of the chapter is organised as follows: The concept of earnings quality is described in section 2.2. Section 2.3 provides an overview of the qualitative characteristics of accounting information. Section 2.4 reviews the main findings from prior literature on the relationship between earnings quality and the stock returns. Section 2.5 provides a summary of the literature on earnings quality and value-relevance of accounting information. Section 2.6 explains earnings quality constructs and measures. Section 2.7 concludes the chapter.

2.2 Earnings Quality Concept

In accounting literature there is no consensus about the definition of earnings quality concept. Teets (2002) expresses that "some consider quality of earnings to

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[6] The Financial Accounting Standards Board (FASB) was established in 1973, "replacing the Accounting Principles Board and the Committee on Accounting Procedure of the American Institute of Certified Public Accountants". The FASB's assignment is "to establish and improve standards of financial accounting and reporting for the guidance and education of the public, including issuers, auditors, and users of financial information". (FASB, 2010)

[7] Conceptual frameworks of Accounting Standard Board (ASB), Theoretical Concepts of Financial Reporting in Iran and International Accounting Standard Board (IASB) also consider the usefulness of accounting information in decision making as the benchmark for measuring effectiveness of accounting standards.

encompass the underlying economic performance of a firm, as well as the accounting standards that report on that underlying phenomenon; others consider quality of earnings to refer only to how well accounting earnings convey information about the underlying phenomenon". Ecker et al. (2006) consider the quality of earnings as a measure of information risk, and they define earnings quality "in terms of precision, namely, the mapping of current accruals into current, last year, and next year cash flows". Schipper and Vincent (2003) view earnings quality in relation to Hicksian income. They define earnings quality as "the extent to which reported earnings faithfully represent Hicksian income, including the change in net economic assets other than transactions with owners". In this concept, earnings are considered as high quality if they are closer to Hicksian income. For Kirschenheiter and Melumad (2004) earnings are of higher quality when they are more informative and closer to the long run value of the firm. Chan et al. (2006) view earnings quality as the degree to which reported earnings reflect operating fundamentals.

Mikhail et al. (2003) consider predictability of earnings and define earnings quality "as the extent to which a firm's past earnings are associated with future cash flows". They view earnings to be of higher quality when they have high predictive value. Scott (2003) views earnings quality from value-relevance perspective and defines earnings quality as the predictive ability of stock returns. White et al. (2003) focus on conservatism in accounting, they define earnings quality as the degree of conservatism in a firm's reported earnings.

Myers et al. (2003), Dechow and Dichev (2002), Balsam et al. (2003), and Francis et al. (2008) consider accruals quality as a proxy for earnings quality. Beneish and Vargus (2002), Penman and Zhang (2002), Richardson (2003), and Revsine et al. (2008) consider the persistence of earnings as a benchmark for assessing earnings quality. Some researchers defines earnings quality as the extent to which reported earnings have less earnings management as well as more timely recognition financial effects of bad news on earnings (e.g., Lang et al., 2003; Ball et al., 2005).

A review of earnings quality definitions in the literature reveals that academic research on earnings quality differs in their views regarding the meaning of the quality of earnings. The authors' definition of earnings quality indicates some features such as accruals quality, persistence, predictability, lack of earnings management, more informative feedback and the conservatism in reported earnings as the benchmarks of earnings quality. They often consider just one aspect of earnings quality in their definitions which relate to relevance or reliability of earnings information. Since definition of earnings quality is a base for measuring of earnings quality, there is an essential requirement for the improvement of a comprehensive and unified definition of earnings quality.

2.3 Qualitative Characteristics of Accounting Information from FASB's Conceptual Framework Viewpoint

The goal of the FASB in setting accounting standard is to enhance the usefulness of the reported information in financial statements. In assessing the usefulness of accounting information to investors, creditors and other users of

financial statements, the FASB considers the 'qualitative characteristics' that make accounting information useful. FASB Concepts Statement No. 2, "*Qualitative Characteristics of Accounting Information*", expresses that "relevance and reliability are the two primary qualities that make accounting information useful for decision making".

FASB Concepts Statement No. 2, explain that "to be relevant, information must be timely and it must have predictive value or feedback value or both. To be reliable, information must have representational faithfulness and it must be verifiable and neutral".

To be relevant, accounting information must be capable of making a difference in a decision. The conceptual framework of FASB explains that "Information can make a difference to decisions by improving decision makers' capacities to predict or by providing feedback on earlier expectations". In addition, timeliness is an important feature of relevance information which is considered as availability of accounting information to users before it loses its capacity in making a difference in a decision (FASB 1980, SFAC No.2).

Reliability is the extent to which accounting information is verifiable, representationally faithful, and neutral (FASB 1980). The FASB's Conceptual Framework, states that "accounting information is reliable to the extent that users can depend on it to represent the economic conditions or events that it purports to represent" (SFAC No. 2, paragraph 62).According to FASB, neutrality means "information should be free from bias towards a predetermined result" (FASB 1980, para. 99).

The FASB Conceptual Framework (SFAC No. 2, Para.90) expresses that "reliability and relevance often impinge on each other". However, the information will not be useful, if either of two primary qualitative characteristics is completely missing. Barua (2006) find that reaction of investors is higher for relevance than reliability of earnings information. However, prior studies in an Iranian context do not provide any empirical evidence in this regard.

2.4 Earnings Quality and the Stock Return

Accounting numbers will influence on stock return if they provide useful information to investors. The first attempts of estimating the usefulness of accounting earnings to investors document in the literature in 1968 when Ball & Brown (1968) and Beaver (1968) indicate that the association between returns and earnings can be used as a benchmark of the earnings information usefulness. Lev (1989) argues that relationship between stock returns and accounting earnings reflects the usefulness of earnings information. He finds that low quality earnings may be causing the relatively low association between reported earnings and stock returns.

Lev and Zarowin (1999) identify the decline in returns-earnings association. Since such association reflects consequences of investors' actions to earnings information, it could be interpreted as a decline in usefulness of accounting information. Atiase & Tse (1986) and Holthausen & Verrecchia (1988) suggest that the information quality may impact the usefulness of accounting earnings.

Chan et al. (2006) study on stock returns and earnings quality for the UK data by the use of accruals as a measure of earnings quality. They explain that

"market may be temporarily misled by focusing on the bottom line earnings and ignoring information about the quality of earnings". They divide accruals into normal and abnormal and measure accruals quality following Sloan (1996). The results confirm that there is an inverse relationship between future stock returns and accruals (firms with low accruals have high returns in future periods). This signifies that high earnings qualities lead to high stock returns in further periods. However, the study reveals that the normal accruals do not predict future returns.

Khajavi and Nazemi (2005) examine the relationship between earnings quality and market- based variables in the Tehran Stock Exchange (TSE). They use accrual as an inverse measure of earnings quality. Their study sample includes 96 firms over the period 1998-2003. The results indicate that there is no significant difference between the average returns of the firms with lowest and highest accruals. Further, they decompose accruals into discretionary and non discretionary components based on sales growth. They find similar results which indicate that stock returns are unaffected by component of accruals.

Ghaemi et al. (2008) study the relationship between the quality of earnings based on accruals and its components with abnormal and normal returns in TSE over period 1998-2005. They disaggregate accruals into discretionary and nondiscretionary items. They find that the returns of stock are affected by accruals magnitude and its components. This means that there is significant difference between stock returns of companies with high accruals and low accruals that is different from the results obtained by Khajavi and Nazemi (2005).

Other study has been done on TSE data by Panahian and Ramezani (2008). They investigate the relationship between earnings quality and the market reaction to raising equity capital from stockholders funds and receivables. They used the modified Jones model (1991) as a measure of earnings quality. The results indicate that there is no significant relation between earnings quality and cumulative abnormal returns. This result is consistent with Khajavi and Nazemi (2005) and inconsistent with Ghaemi et al. (2008).

A review of the literature indicates that studies on earnings-returns association usually consider quantity of earning and ignore its quality in their analyses. Furthermore, there are a few studies in connection with earnings quality and the stock returns, in which they have just used abnormal accruals as a measure of earnings quality. In fact, abnormal accruals actually measure earnings management which is just one of the earnings quality aspects. Additionally, the review of research into the Tehran Stock Exchange (Khajavi and Nazemi, 2005; Panahian and Ramezani, 2008; Ghaemi et al., 2008) indicates some different results might be due to the use of different methods to measure accruals quality. These studies do not measure all earnings quality information in their research since earnings quality attributes used in these investigations assess just one aspect of earnings quality.

In line with the above views, the accounting literature may provide an incomplete picture of the effect of earnings quality on the behaviour of stock returns. Therefore, it is necessary to provide as the empirical results on the relationship between the qualitative characteristics of accounting earnings and

stock return in Tehran Stock Exchange with the use of different criteria in measuring of earnings quality. In this respect, this study examines whether the qualitative characteristics of accounting earnings are associated with stock returns. It is expected that earnings quality reduces the level of risk and investors' expected return rate. Indeed, if investors correctly price earnings quality, it affects stock price and returns.

2.5 Earnings Quality and Value-Relevance of Accounting Information

The value-relevance of accounting information is considered as the ability of accounting numbers to reflect information used by investors in the equity valuation process (Collins et al., 1997; Francis and Schipper, 1999; Hung, 2001). Value-relevance, as a measure for the usefulness of accounting number in equity valuation, is based on the premise that, if accounting information is useful, investors will modify their behaviour and the stock market will react through effects on prices and returns.

The market's expectation of firm performance is reflected in the market value of equity. Earnings, as a reliable indicator of future performance, and book value of equity, as a representative of past performance, provide useful information which is relevant information in valuing a firm's equity (Marquardt and Wiedman, 2004). Thus, in accounting literature these items are widely used as the basis for evaluation of a firm's equity by prior studies (e.g. Dechow, 1994; Ohlson, 1995; Barth and Kallapur, 1996; Penman, 1998; Whelan and McNamara, 2004; Marquardt and Wiedman, 2004).

Since the FASB considers earnings information and its components as the primary focus of financial statements (FASB 1978, SFASB No.1), many studies have focused on the value-relevance of earnings (e.g., Beaver et al., 1968; Ball and Brown, 1968; Bowen, 1981; Daley, 1984; Lipe, 1986; Fairfield et al., 1996). They have provided empirical documents about the association between earnings and the market value of equity. However the value-relevance of book value did not significantly attract researchers' attention until Ohlson (1995) considered both earnings and book value as main factors in the equity valuation process.

Many studies find that the value-relevance of accounting number has decreased in recent years (Ely and Waymire, 1999; Francis and Schipper, 1999; Lev and Zarowin, 1999; Graham et al., 2000; Ho et al., 2001; Core et al., 2003; Thinggaarda and Damkierb, 2008). However, some studies investigate the relative value-relevance of earnings and book value of equity and find that the market shifts its reliance from earnings to book value. They document that this shift is mainly due to an increase in the occurrence of reported losses (Hayn, 1995) and the extent of extraordinary and abnormal items (Elliott and Hanna, 1996), as well as a decrease in firm size (Wild, 1992). These reasons, which are associated with a decrease in the value-relevance of accounting earnings in equity valuation, have also proven to be related to an increase in the value-relevance of book value in the valuation process (Berger et al., 1996; Collins et al., 1997; Barth et al., 1998).

Collins et al. (1997) express two explanations for the shift reliance from earnings to book value: "(1) book values serve as a better proxy for future earnings when current earnings contain large transitory components, and (2) book

values serve as a proxy for the firm's abandonment option". They state that "the value-relevance of earnings and book values move inversely to one another, and that if the value-relevance of earnings has decreased over time then the value-relevance of book values should have increased".

Prior studies (e.g., Berger et al., 1996; Burgstahler and Dichev, 1997; Collins et al., 1997; Barth et al., 1998; Francis and Schipper, 1999; Whelan and McNamara, 2004) find that the decline in value-relevance of earnings is offset by the increase in value-relevance of book value. Francis and Shipper (1997) argue that the combined value-relevance of earnings and book values has not decreased over time. Moreover, Collins et al. (1997) provide evidence that the combined value-relevance of earnings and book value have slightly increased over time. They find a decline in value-relevance of earnings and an increase in the value-relevance of book value over time.

Studies of the Tehran Stock exchange (TSE) show a positive association between accounting information (i.e. earning, book value of equity and dividends) and stock price (Safajou et al., 2005; Pourheydari et al., 2008). Barzegari Khanagha et al. (2011) examine the value-relevance of accounting information in the Tehran Stock Exchange (TSE) for the period 1996-2008. The results indicate that accounting information has value-relevance in the TSE and value-relevance of earnings is higher than book value in determining stock price. They also compare the value-relevance of accounting items before and after the codification of the national accounting standard in 2001. They find a decline in the value-relevance of accounting information after the codification of the national

accounting standard. They interpret these results as representing the inefficiency of the codification of the national accounting standard in improving the value-relevance of accounting information.

In value-relevance literature a few study have investigated the role of earnings quality on the value-relevance of accounting information. Steven et al. (2009) investigate the association between earnings quality and the value-relevance of earnings using the earnings-future cash flows relation and persistence of earnings as measures of earnings quality. They provide evidence suggesting the value-relevance of earnings is more positively associated with earnings quality in countries with lower information opaqueness and higher investor protection. This finding suggests that price reactions depend on earnings quality and the ability of investors to derive benefit from that information. Jeon et al. (2004) use the persistence of abnormal earnings as a measure of earnings quality and investigate whether earnings quality affects the value-relevance of book value and earnings using Ohlson's (1995) theoretical framework. They find that the persistence of abnormal earnings has a systematic relationship with book value of equity and earnings. Wysocki (2009), using the earnings response coefficient (ERC) as a measure of earnings quality, finds that ERC which captures the association between stock returns and earnings, is positively correlated with accruals quality. DeFond et al. (2007) examine "cross-country differences in the information content of annual earnings announcements" using earnings management as an inverse measure of earnings quality. They assess the informativeness of annual earnings announcements as a variance of abnormal return around the earnings announcement date, where higher variance indicates greater informativeness of

annual earnings announcements (Warner et al., 1988; Bamber et al., 2000; Landsman and Maydew, 2002). They document that annual earnings announcements have greater information content in countries with higher earnings quality.

Marquardt et al. (2004) and Whelan and McNamara (2004) investigate whether earnings management influences the value-relevance of accounting information. After controlling the effects of leverage, negative earnings, firm growth, and firm size, they find that earnings management decreases the value-relevance of earnings in equity valuation. They also find that, in the presence of earnings management, book value plays a greater role in valuing a firm's equity.

Investors are one of the major groups of decision makers that use accounting information in valuing a firm's equity and, therefore, it is important to investigate the extent to which accounting information reflects in equity valuation by investors. Since higher quality earnings is considered as a better measure of firm's underlying economic performance, they should be more useful information in helping investors assess firm value. Chan et al. (2006, p.1042) express that "in the context of stock prices, to the extent that the market fixates on reported income and does not take into account the quality of firms' earnings, there may be temporary deviations of prices away from their correct values". In fact, value-relevance of earnings might be expected to vary, depending on the level of earnings quality.

A review of the literature indicates that a few studies have examined the effect of persistence of earnings, as a measure of earnings quality, on the value-

relevance of accounting information (Jeon et al., 2004; Steven et al., 2009). Particularly, these studies, by measuring one or two attributes of earnings quality, do not capture all information about earnings quality and its effect on the value-relevance of accounting information in their empirical results. As a result, there is an important gap in the value-relevance literature relating to the role of earnings quality in three interrelated issues; shift of value-relevance from earnings to book value, the offset of the decline in the value-relevance of earnings by the increase in the value-relevance of book value, and changes in the value-relevance of accounting information over time.

2.6 Earnings Quality Constructs and Measures

In the literature of earnings quality, there are different studies which often focus on just one earnings quality attribute. Therefore, there is a variety of definitions leading to a multitude of earnings quality measures in the literature. Recently, accruals quality has attracted researchers' attention as a significant indicator related to earnings quality. But there is no generally accepted method of measurement (Hermanns 2006). Williams (2005) states that earnings quality principally possesses three determinants such as the sustainability of earnings, the earnings persistence and earnings management.

Francis et al. (2004) consider earnings quality attributes into two categories: market-based and accounting-based. The market-based includes value-relevance, conservatism, and timeliness. These attributes are measured by using the relationship between accounting earnings and returns or price. The accounting-based comprises of the accrual quality, predictability, smoothness, and persistence

that these attributes are measured by the use of accounting information such as cash, accruals and earnings. Barua (2006) considers earnings quality constructs from FASB viewpoint and measures earnings quality by using the FASB qualitative characteristics, reliability and relevance. He uses abnormal accruals and accruals quality as a measure of representational faithfulness and verifiability as well as predictive value and feedback value as a measure of earnings relevance.

Schipper and Vincent (2003) argue about several categories of earnings quality constructs that have been used in literature. Their classification of earnings quality constructs is derived from "(1) the time-series properties of earnings; (2) selected qualitative characteristics in the FASB's Conceptual Framework; (3) the relations among income, cash, and accruals; and (4) the implementation decisions".

In this section, according to the studies of Schipper and Vincent (2003), the four categories will be clarified with more detailed explanation of the prior researches about each subcategory.

2.6.1 Earnings Quality Constructs Derived from Time-Series Properties of Earning

Time-series constructs include persistence, predictability, and smoothness. These attributes are characterized by the behavior of the time-series of earnings.

2.6.1.1 Persistence

Persistence is one of the most important measurements of earnings quality. Several researchers consider it to be one of the qualitative attributes of earnings

from the perspective of value-relevance (e.g., Bernstein and Wild, 2000; Penman and Zhang, 2002; Beneish and Vargus, 2002; Richardson, 2003; Revsine et al., 2008). Persistence is viewed to the extent to which earnings performance persists into the next period. 'Sustainability' is sometimes used as a synonym for 'persistence'. Drake et al. (2007) have studied the relation between information disclosure and persistence and found out that the persistence of accruals and cash flows are reflected in returns of stock in conditions where the information disclosure is of high quality.

Lipe (1990) views earnings persistence as autocorrelation of earnings. Schipper and Vincent (2003) express that "a highly persistent earnings number is viewed by investors as sustainable, that is, more permanent and less transitory". Sloan (1996) and Coulton et al. (2005) measure earnings persistence as an ordinary least squares regression of next year's earnings against current earnings. Following previous research (e.g., Lev 1983; Ali and Zarowin, 1992) , Francis et al. (2004) measure earnings persistence as the slope coefficient (β1) from the autoregressive (AR1) model of current net profit before abnormal items against previous net profit before abnormal items, shown as below :

$$NPBA_{j,t} = \alpha_{0,j} + \beta_{1,j} NPBA_{j,t-1} + \varepsilon_{j,t}$$

$NPBA_{j,t}$ = net profit before abnormal items in year t.

Values of $\beta_{1,j}$ close to 1 or greater imply highly persistent earnings, while values of $\beta_{1,j}$close to 0 imply less persistent and highly transitory earnings.

Sloan (1996) and Richardson et al. (2005) linked accrual reliability to earnings persistence. They found that lower reliable accruals lead to lower persistence of earnings. Richardson et al. (2005) measure the persistence of the components of earnings (cash flow and accruals) and reliability of accruals as follows:

$$NPBA_{j,t} = \alpha_{0,j} + \beta_{1,j} CFO_{j,t-1} + \beta_{2,j} TAC_{j,t-1} + \varepsilon_{j,t}$$

Where,

$CFO_{j,t-1}$ = $firm_j$'s cash flow from operations in $year_{t-1}$.

$TAC_{j,t-1}$= $firm_j$'s total accruals in $year_{t-1}$= $NPBA_{j,t}$ - $CFO_{j,t-1}$.

All variables are deflated by total assets.

The above $\beta_{1,j}$ implies the persistence coefficient of cash flows and $\beta_{2,j}$ implies the persistence coefficient of accruals. In order to focus on the relative persistence of accruals, Richardson et al. (2005) replaced the cash flows component of earnings performance by earnings performance itself and estimated a slightly modified version of the above regression as follows:

$$CFO_{j,t} = NPBA_{j,t} - TAC_{j,t}$$

$$NPBA_{j,t} = \alpha_{0,j} + \beta_{1,j} (NPBA_{j,t-1} - TAC_{j,t-1}) + \beta_{2,j} TAC_{j,t-1} + \varepsilon_{j,t}$$

$$NPBA_{j,t} = \alpha_{0,j} + \beta_{1,j} NPBA_{j,t-1} + (\beta_{2,j} - \beta_{1,j}) TAC_{j,t-1} + \varepsilon_{j,t}$$

$$NPBA_{j,t} = \alpha_{0,j} + \rho_{1,j} NPBA_{j,t-1} + \rho_{2,j} TAC_{j,t-1} + \varepsilon_{j,t}$$

So $\rho_{1,j} = \beta_{1,j}$ and $\rho_{2,j} = (\beta_{2,j} - \beta_{1,j})$

The above model provides a direct estimate of $(\beta_{2,j}-\beta_{1,j})$ by $\rho_{2,j}$. The value of $\rho_{2,j}$ measures reliability of accruals. The value of $\rho_{2,j}$ more than 0 implies highly reliable accruals and earnings quality, while value of $\rho_{2,j}$ close to 0 or more negative implies less reliable accruals and earnings quality.

2.6.1.2 Predictability

The predictive value (PV) of earnings is considered as the ability of past earnings to predict current year earnings (Lipe, 1990; Fairfield et al., 1996; Wild, 1996; Barth, Beaver and Landsman, 2001; Cohen, 2004; Barua, 2006). Earnings are considered to be of higher quality when they have high predictability. Predictive value is an important part of the decision-making process and relates to value-relevance which is illustrated in the FASB's Concepts Statement No. 2 (Para. 51) as follows: "information can make a difference to decisions by improving decision makers' ability to predict". Earnings predictability can affect decision making by constructing anticipations about future earnings. Thus, stock market performance demonstrates a strong focus on earnings predictability.

Lipe (1990) exhibits a measure of earnings predictability based on the variance of earnings (i.e. variance decreases, the predictability increases). Francis et al. (2004) adopt Lipe (1990) and provide a measure of earnings predictability by "using the square root of the estimated error variance from the earnings persistence equation" as follows:

$$NPBA_{j,t} = \alpha_{0,j} + \beta_{1,j} NPBA_{j,t-1} + \varepsilon_{j,t}$$

Predictability $=\sqrt{\sigma^2(\hat{\varepsilon}\,j)}$

Mikhail et al. (2003) measure earnings quality as the ability of earnings to predict future cash flows. SFAC No.1 states that "one of the main objectives of accounting earnings is to predict the timing, amount and uncertainty of future cash flows" (FASB 1978, para, 37). Earnings and cash flow prediction play a critical role in investment decisions. Investors need information about future cash flow because their investment is the present value of the future cash flows that will be created by the firm in which they invest. Also the power of a firm to generate earnings and cash flow is reflected in the market value of its equity. Therefore, predicting future earnings and cash flow helps to predict stock return which is a fundamental factor in selecting optimal investment portfolios.

Barua (2006) measures earnings predictability by modelling future earnings "as a function of current earnings as well as components of current earnings". Barth et al., (2001) and Fairfield et al., (1996) found that disaggregation of earnings into its components may improve the predictive ability to estimate year-ahead earnings.

- Future earnings on components of current earnings

Earnings would be divided into two elements: cash flows and accruals (NPBA=COF+TAC).

$$NPBA_{j,t} = \alpha_{0,j} + \beta_{1,j} CFO_{j,t-1} + \beta_{2,j} TAC_{j,t-1} + \varepsilon_{j,t}$$

$$\text{PVE} = |\varepsilon_{j,t}|$$

- Future cash flows on components of current earnings

$$CFO_{j,t} = \alpha_{0,j} + \beta_{1,j} CFO_{j,t-1} + \beta_{2,j} TAC_{j,t-1} + \varepsilon_{j,t}$$

$$\text{PVCF} = |\varepsilon_{j,t}|$$

Where,

PVE = Predictive value of earnings

PVCF= Predictive value of cash flow

The absolute value of the residual from the regression model is an inverse measure of earnings quality. Thus, large values of the absolute value of the residual indicate less predictability of earnings and vice versa.

2.6.1.3 Earnings Smoothness

Earnings smoothing is the reduction of volatility in reported earnings over time which is a special case of earnings management (earnings manipulation). Goel and Thakor (2003, p.152) describe "smoothing of earnings can be either 'artificial' or 'real'. Real smoothing involves decisions that affect cash flows. Artificial smoothing reduces the expected value of the time-series volatility of reported earnings". Artificial smoothing involves decisions that affect accruals since management reduce volatility of earnings by manipulating in accruals.

Levitt (1998) indicate that managers have smoothed earnings because they believe that lower variable earnings are preferred by investors. Trueman and Titman (1988) suggest that managers affect investors' perceptions by smoothing

earnings. In the same stream of thinking, Goel and Thakor (2003) imply that smoothness in earnings encourages uninformed investors to enter the market. Chaney et al. (1995) and Demski (1998) argue that managers smooth out transitory fluctuations by using their private knowledge about future earnings. Tucker and Zarowin (2006) indicate that the informativeness of earnings is increased by smoothing. Subramanyam (1996) and Schipper & Vincent (2003) confirm that earnings smoothness improves the persistence and predictability of reported earnings. However, high quality earnings would recommend less use of accruals in earnings smoothing.

Hunt et al. (2000) calculate earnings smoothness as the ratio of the standard deviation of nondiscretionary net profit to the standard deviation of operating cash flows. Leuz et al. (2003) employ two measures of earnings smoothness: the "ratio of the standard deviation of operating income scaled by assets, to the standard deviation of cash flows scaled by assets" (a smaller ratio indicates more earnings smoothing); and "the correlation between changes in accruals and changes in operating cash flows" (larger magnitudes of negative correlation show more income smoothing). Bowen et al. (2003) employ the "ratio of the standard deviation of operating cash flows divided by the standard deviation of earnings" as the measure of earnings smoothness as follows:

$$\text{Smooth}_{j,t}=\frac{\sigma(\text{CFO}_{j,t})}{\sigma\,(\text{NPBA}_{j,t})}$$

Where,

$\sigma\,(CFO_{j,t})$ = firm_j's standard deviation of operating cash flows inyear_t.

$\sigma\ (NPBA_{j,t})$ = firm$_j$'s standard deviation of net profit before abnormal items in year$_t$.

Ratios of more than 1 indicate less variability in earnings relative to the variability of operating cash flows which implies the use of accruals to smooth earnings. Thus, large (small) values of smoothness indicate more (less) earnings smoothness and low (high) earnings quality.

The above ratio employs operating cash flow as the reference construct for unsmoothed earnings, and measure smoothness as the ratio of cash flows variability to variability of earnings (i.e., ratio controls for the underlying variability of operating cash flows).

Since accruals are manipulated in earnings smoothing by managers, smoothing of earnings has considered as an earnings management instrument. Therefore, smoothness of earnings declines the reliability of earnings information and can be used as a measure of earnings reliability.

2.6.2 Earnings Quality Constructs Derived from Relations among Income, Accruals and Cash

According to accounting standards, accounting earnings must be calculated on the basis of accrual method. In the accrual method, revenue and expense items are recognised when they have been realized. In accrual approach, realization does not signify the necessity that cash should be paid or received through transaction (Ronen and Yaari 2008). Therefore, earnings can be divided into two elements: cash and accruals.

The gap between earnings and cash is termed as accruals which arise from the difference between the timing of the accounting recognition of the transaction and the timing of cash flows. The accruals require assumptions, management judgments and estimates about future realization of earnings into cash flows "which may be influenced by biases in the estimation process or estimators' judgments that result in misrepresentation of economic phenomena" (Barua, 2006, p.8). "However, the accrual component of earnings is subject to greater uncertainty than is the cash flow component, because accruals are the product of judgments, estimates, and allocations (of cash flow events in other periods), while the cash flow component of income is realized" (Francis et al., 2005, p.301).

Accrual accounting can provide more relevant information to investors on the one hand, but it can also introduce error and bias, resulting in less reliable information on the other. Sloan (1996) suggested that "accruals may be less informative than cash flows because they are less reliable and thus more susceptible to estimation error and managerial manipulation". Accruals quality plays a critical role in determining the reliability of earnings information to users. Thus, accruals quality has used to assess the quality of earnings by several researchers (e.g., Dechow and Dichev, 2002; Balsam et al., 2003; Myers et al., 2003; Francis et al., 2004; Biddle et al., 2008).

Under these constructs, there are four metrics: Ratio of Cash from Operations to Income, Changes in Total Accruals, Direct Estimation of Abnormal (Discretionary) Accruals Using Accounting Fundamentals and Direct Estimation of Accruals-to-Cash Relations.

2.6.2.1 Ratio of Cash from Operations to Income

Researchers suggest that earnings will be more desirable if they are more closely into cash (e.g. Harris et al. 2000; Penman 2001; Francis et al. 2008).Thus, the greater the proportion of cash flow in earnings indicates the higher quality of earnings. Some studies (e.g., Harris et al., 2000; Penman, 2001) consider the ratio of cash flow from operations (CFO) to earnings as a measure of earnings quality.

Ratio of CFO to NPBA = $CFO_{j,t}/NPBA_{j,t}$

$CFO_{j,t}$= $firm_j$'s cash flows from operations in year t.

$NPBA_{j,t}$ = $firm_j$'s net profit before abnormal items in year t.

Large (small) values of ratio indicate high (low) earnings quality.

2.6.2.2 Changes in Total Accruals

DeAngelo (1986) presents an approach which measures earnings quality through the change in total accruals. Schipper and Vincent (2003) argue that some portion of accruals is almost constant over periods and non-manipulated. Therefore, they consider changes in total accruals as a measure of earnings management (managerial manipulations in accounting earnings) which is an inverse measure of earnings quality. Sloan (1996) suggests that increasing accruals are as the indicators of deterioration in earnings and stock returns. According to Dechow, Sloan, and Sweeney (1995), a change in total accruals may also be an indicator that firms are engaging in earnings management. Dechow, Richardson, and Tuna (2003) show a high correlation (80% or more) between

total accruals and non-discretionary accruals in US firms. Coulton and Taylor (2005) also confirm this correlation for Australian data. Thus, change in total accruals could also be used as a simple indicator for unexpected accruals (often referred to as reflecting earnings management).

According to Hribar and Collins (2002) changes in total accruals is derived from the difference between earnings and cash flows from operations.

$$TAC_{j,t} = NPBA_{j,t} - CFO_{j,t}$$

In this approach, large (small) values of accruals indicate low (high) earnings quality.

2.6.2.3 Direct Estimation of Discretionary (Abnormal) Accruals Using Accounting Fundamentals

This approach relies on accounting fundamentals to separate accruals into non-discretionary and discretionary components. According to Ronen and Yaari (2008), non-discretionary accruals (expected or normal accruals) are accruals that "arise from transactions made in the current period that are normal for the firm given its performance level and business strategy, industry conventions, macro-economic events, and other economic factors". Discretionary accruals (abnormal accruals or unexpected) are accruals that "arise from transactions made or accounting treatments chosen in order to manage earnings". Discretionary accruals reflect manipulation of earning by management which is widely used in the accounting literature as a measure of earnings management and as an inverse assessment of earnings quality.

Chan et al. (2006) use discretionary accruals as an inverse measure of earnings quality. They argue that managerial intent to mislead investors may be reflected in earnings quality. They find that managers sometimes manipulate accounting accruals in order to report earnings that are greater than the actual earnings. The function of earnings management leads to the higher application of discretionary accruals.

In accounting Literature, the Jones Model (1991) has widely used for measuring discretionary accruals. Jones takes into account changes in revenue and gross property, plant, and equipment to control the economic conditions on the accruals level. The Jones Model separates abnormal accruals from normal accruals. It calculates normal and abnormal accruals by the use of regression model as follows:

$$TA_{j,t} = \alpha_{0_{j,t}} + \beta_1 \Delta REV_{j,t} + \beta_2 PPE_{j,t} + \varepsilon_{j,t}$$

Where,

$\Delta REV_{j,t}$= $firm_j$'s change in revenue from $year_{t-1}$ to $year_t$.

$PPE_{j,t}$ = $firm_j$'s property, plant and equipment in $year_t$.

ABAC (abnormal accruals) =$|\varepsilon_{j,t}|$.

Total accruals (TA) are calculated as follows:

$$TA_{j,t} = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta CASH_{j,t} + \Delta STDEBT_{j,t} - DEPN_{j,t},$$

where:

$\Delta CA_{j,t}$= $firm_j$'s change in current assets from $year_{t-1}$ to $year_t$.

$\Delta CL_{j,t}$= $firm_j$'s change in current liabilities from $year_{t-1}$ to $year_t$.

$\Delta CASH_{j,t}$= $firm_j$'s change in cash from $year_{t-1}$ to $year_t$.

$\Delta STDEBT_{j,t}$ = $firm_j$'s change in short-term debt from $year_{t-1}$ to $year_t$.

$DEPN_{j,t}$= $NAC_{j,t}$depreciation and amortization expense in $year_t$.

Normal accruals are measured as the modified version of the Jones model (Dechow et al, 1995):

$$NAC_{j,t} = \alpha_{0_{j,t}} + \beta_1(\Delta REV_{j,t} - \Delta REC_{j,t}) + \beta_2 PPE_{j,t}$$

Where:

$NAC_{j,t}$ = $NAC_{j,t}$ normal accruals.

$\Delta REC_{j,t}$ = $firm_j$'s change in receivables, all other variables are as previously mentioned.

Abnormal accruals (AAC) are the difference between total accruals and normal accruals that is measured as follows:

$$AAC_{j,t} = TAC_{j,t} - NAC_{j,t}$$

Quality of earnings is estimated through the absolute value of the abnormal accruals ($|AAC_{j,t}|$) calculated as shown above. The large (small) quantity of the absolute value indicates low (high) earnings quality.

Kothari et al. (2005) argue that firm performance is correlated with accruals. They include ROA (ratio of return on assets) as an additional independent variable in the discretionary accrual regression.

Discretionary accruals are actually a representative for manipulation of earnings by management (often referred to as earnings management). Accordingly, this method is often considered as an inverse measure of earnings reliability.

2.6.2.4 Direct Estimation of Accruals-to-Cash Relations

Accruals shift the recognition of cash flows over time and provide information about future cash flows. Dechow and Dichev (2002) state that the magnitude of accrual estimation errors decrease the quality of accruals and earnings. They propose a regression model of changes in working capital on last-period, current-period, and next-period operations cash flows and measure accruals quality as a variance of the residuals from regression model. This model estimates errors in accruals which relates to the match between realization of operating cash flow and working capital accruals. A strong match indicates high quality of accruals and earnings.

McNichols (2002) modifies the Dechow and Dichev approach by the use of the fundamental variables of the Jones model (property, plant and equipment, and change in revenues). This measure is based on as the absolute value of residuals from the following time-series regression model:

$$TCAC_{j,t} = \alpha_{0_{j,t}} + \beta_1 CFO_{j,t-1} + \beta_2 CFO_{j,t} + \beta_3 CFO_{j,t+1} + \beta_1 \Delta REV_{j,t}{}_{j,t} + \beta_2 PPE_{j,t} + \varepsilon_{j,t}$$

Where:

$TCAC_{j,t}$ =firm$_j$'s Total current accruals in year$_t$.

$TAAC_{j,t} = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta CASH_{j,t} + \Delta STDEBT_{j,t}$,

ABAC (abnormal accruals) $= |\varepsilon_{j,t}|$.

All other variables are as previously defined.

The larger absolute value of residuals expresses that the variations in accruals are not explained by (last, current and next) cash flows from operations. Therefore, it is as an inverse measure of earnings quality.

As mentioned, this method measures the magnitude of accrual estimation errors which can be used as a reliability measure of earnings information.

2.6.3 Earnings Quality Constructs Derived from FASB's Conceptual Framework

According to the conceptual framework, the qualitative characteristics of financial statements enhance the usefulness of accounting information in decision making (FASB 1980). Therefore, the usefulness of accounting information mostly relies on the reliability and relevance of information which are considered as two primary qualities of accounting information. In this construct, quality of

accounting information is measured in terms of relevance, reliability and comparability (Schipper and Vincent, 2003).

2.6.3.1 Relevance

Francis et al. (2004) measure relevance of earnings information as the ability of earnings to explain changes in stock returns. Barth et al. (2001) argue that earnings information will be reflected in the market value of equity when the information is relevant and reliable to investors. Therefore, they consider value-relevance as a measure of both relevance and reliability of earnings information.

In this construct, the effects of accounting figures in returns are used as the benchmark to evaluate the quality of accounting information. Earnings with greater value-relevance are viewed as high quality because value-relevance of earnings is considered as a measure of earnings information usefulness.

According to Bushman et al. (2004) and Francis et al. (2004) value-relevance is R^2 which is derived from the following regression model:

$$RET_{j,t} = \alpha_{0_{j,t}} + \beta_1 \Delta NPBA_{j,t} + \beta_2 NPBA_{j,t} + \varepsilon_{j,t}$$

Where,

$RET_{j,t}$ is $firm_j$'s 15-month return ending three months after the end of financial $year_t$.

$\Delta NPBA_{j,t}$ is the change in $firm_j$'s profit before abnormal items in annual period t, scaled by market value at the end of the annual period t-1

2.6.3.2 Comparability

The capability to compare the financial reports of different periods of different firms is considered as comparability. This construct requires that different firms employ the same accounting standards, accounting procedures to make estimates and judgments in the same way. Therefore, it would be difficult to be measured for different firms (Wong, 2008).

2.6.4 Earnings Quality Constructs from Implementation Decisions

According to Schipper and Vincent (2003), this construction focuses on the incentives and expertise of regulators and auditors. This perspective can be distinguished in two factors. The first one is inversely related to the quality of earnings with the amount of forecasts, judgments and estimates required of financial statements regulators. Clearly, the quality of earnings decreases when the proportion of management estimations in reported figures is increased. The second factor focuses on the earnings quality which would be inversely related to the extent to which regulators take advantage of the need to exercise judgment and estimates to make forecasts, which leads to implementations that subvert the intent of the standards.

Earnings management studies are based on this construct. Moreover timeliness and conservatism are the result of judgment and estimation and can be classified within the category of managerial decisions because conservative accounting is a choice of management and timeliness of loss recognition is related to the concepts of conservatism (Wong, 2008). Consequently, earnings management, conservatism and timeliness are grouped under this category.

2.6.4.1 Earnings Management

According to Healy and Wahlen (1999), "earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers". Sugiri (1998) and Utari (2001) express two definitions for earnings management. The first one, in a narrow sense, refers to a manager behavior to 'play' with discretionary accruals components in calculating the earnings. The second, in a wider sense, deals with a manager's action to increase (decrease) reported earnings of a unit under his responsibility, without any change in long term economic profitability of the unit.

Teets (2002) states that the selection of accounting methods, estimates and judgments made by management for implement the chosen alternatives effect on earnings quality. In the same stream of thinking, Lang et al. (2003) and Ball and Shivakumar (2005) consider earnings to be of higher quality when earnings management is less and the financial effects of bad news are recognized earlier.

In accounting literature, discretionary accruals and total accruals are used as a proxy of earnings management (as mentioned in section 2.6.2.3).

2.6.4.2 Conservatism

According to Penman and Zhang (2002), conservatism in accounting is defined as the choice of accounting procedures or estimates that keep the book values of net assets relatively low. Conservatism in earnings is a significant determinant of

earnings quality (White et al., 2003; Ball and Shivakumar, 2006). Watts (2003) considers earnings conservatism as a desirable attribute. Ball et al. (2000) define conservatism as "the extent to which current-period accounting income asymmetrically incorporates economic losses and gains".

Basu (1997) employs the ratio of bad news response to good news response as the measures of conservatism. He uses the returns response coefficient reverse regression model of unexpected earnings on unexpected returns and measured earnings conservatism as the ratio of the slope coefficients on negative returns to the slope coefficients on positive returns in a reverse regression of earnings on returns (β1+ β2)/β1 from the following regression:

$$RET_{j,t} = \alpha_{0_{j,t}} + \beta_1 \Delta NPBA_{j,t} + \beta_2 NPBA_{j,t} + \varepsilon_{j,t}$$

$$NPBA_{j,t} = \alpha_{0_{j,t}} + \alpha_{1_{j,t}} \mathrm{NEG}_{j,t} + \beta_1 RET_{j,t} + \beta_2 (\mathrm{NEG}_{j,t} * RET_{j,t}) + \varepsilon_{j,t}$$

Where:

NEG is an indicator variable that takes the value one when RET is negative and zero otherwise.

RET is the 15 month return ending three months after the ending of the financial year.

Values of the ratio indicate conservatism degree. The larger ratio equals greater conservatism and the greater conservatism implies higher earnings quality.

Basu's model has been employed in several researches to measure the extent of earnings conservatism (e.g., Pope and Walker, 1999; Givoly and Hayn, 2000;

Ball et al., 2003; Chaney and Philipich, 2003; Krishnan 2003a, Bushman et al., 2004; Francis et al., 2004). Recently, Dietrich et al. (2007) and Givoly, Hayn and Natarajan (2007) have criticized the measurement as not always capturing conservatism. Givoly and Hayn (2000) use the magnitude of accruals as an alternative measure of conservatism; they argue that more negative accruals, on average, are the indicator of conservatism.

Chen et al. (2007) state that conservative in accounting may limit earnings management because it reduces managers' incentive to increase accounting earnings through earnings management. Thus, it can be used as a direct measure of earnings reliability.

2.6.4.3 Timeliness

The conceptual framework of FASB, explain that "timeliness, that is, having information available to decision makers before it loses its capacity to influence decisions, is an ancillary aspect of relevance. If information is not available when it is needed or becomes available so long after the reported events that it has no value for future action, it lacks relevance and is of little or no use. Timeliness alone cannot make information relevant, but a lack of timeliness can rob information of relevance it might otherwise have had".

The timeliness is an important attribute of earnings quality because timely information is considered as the usefulness of information to users such as managers, investors, creditors. According to Basu (1997), the recognition of the earnings timeliness refers to the magnitude that current earnings reflect value relevant information. In the timeliness literature, there is an increasing trend to

reflect financial effects of bad news more quickly in earnings than good news. Hence, the earnings timeliness is related to the concepts of conservatism.

According to Francis et al. (2004), timeliness is the explanatory power of a reverse regression of earnings on returns. Timeliness of earnings is measured in the same way as Ball, Kothari and Robin (2000), Francis et al. (2004), and Bushman et al. (2004) as the R^2 in the conservatism model of Basu (1997) mentioned in section (2.6.4.3). Higher R^2 implies more timeliness and higher quality of earnings.

Timeliness is also measured by the reporting lag, in term of days, from the end of the fiscal year to the actual earnings announcement date (Lee, 2004; Velury and Jenkins, 2006; Mahmud et al., 2009). This approach is more consistent with the FASB's definition of timeliness.

2.7 Conclusion

In the literature, accounting earnings are widely used to predict future stock returns. Furthermore, the relationship between earnings and price or returns (as value-relevance of earnings), are considered in measuring the usefulness of earnings information. Moreover, in the value-relevance literature, major studies focus on shift of value-relevance from earnings to book value and changes in the value-relevance of accounting information over time. However, these studies usually do not take into account the quality of earnings in their empirical analyses. Therefore, the accounting literature may present an insufficient picture of the role

of earnings quality in the behaviour of stock returns and value-relevance of accounting information.

A review of the literature also indicates that there are various aspects of earnings quality concept, which include accruals quality, persistence, predictability, lack of earnings management, more informative feedback and the conservatism in reported earnings. A variety of earnings quality definitions leads to focus on various aspects of earnings quality by different studies. Many studies have applied accruals as benchmarks of earnings quality and have often used abnormal accruals to measure earnings quality. But abnormal accruals actually measure earnings management which is just one of the earnings quality aspects.

FASB Concepts Statement No. 2 expresses that "relevance and reliability are the two primary qualities that make accounting information useful for decision making". However, extant studies in accounting literature have usually measured earnings quality by using one dimension of qualitative characteristics of accounting information (relevance and reliability). These studies do not measure all earnings quality information in their research since earnings quality attributes used in these investigations assess just one aspect of earnings quality. Given this, there is a significant need for the improvement of earnings quality concept and construct by using various components of both dimensions of qualitative characteristics of accounting information; reliability and relevance.

According to Barua (2006), this study considers earnings quality constructs which reflect the usefulness of earnings information in decision making. This is particularly important because the FASB and IASB specify accounting

information quality from the perspective of usefulness in making economic decisions to the users. Theoretical concepts of financial reporting in Iran also has a similarly view to FASB and IASB in the primary qualities of accounting information. They focus on decision usefulness, as the primary objective for financial reporting, from the investors' viewpoint as they are the major users of accounting information. Therefore, the present study takes into account the conceptual framework of FASB and defines the quality of earnings as the extent to which reported earnings capture both dimensions of the qualitative characteristics of accounting information; relevance and reliability. This definition encompasses different aspects of the earnings quality concept since it considers both primary determining factors of earnings quality; relevance and reliability.

In line with the above definitions, the study systematizes earnings quality constructs by using major components of earnings quality dimensions, reliability and relevance. According to the conceptual framework of FASB, to be relevant, accounting information should enhance decision makers' capacities to predict or modify earlier expectations or both as well as information should be available to users in a timely manner. Furthermore, more persistence of earnings is better indicator of future earnings and cash flows, and so can be more relevant information for equity valuation (Dechow et al. 2010). Thus, the present study considers predictive value, feedback value, persistence, and timeliness as a measure of earnings relevance.

Reliability, along with relevance, is regarded to be one of the two primary qualities of accounting that make accounting information useful for decision-

making. As mentioned, reliability is the extent to which accounting information is representationally faithful, verifiable, and neutral (FASB 1980). There is no separate measure for these criteria. However, prior studies usually measure reliability of earnings information by using abnormal accruals. Considering the role of accruals in the reliability of earnings information, this study uses abnormal accruals, conservatism, smoothness, and accruals quality to measure reliability of earnings information.

Chapter 3

The Qualitative Characteristics of Accounting Earnings and Stock Return

3.1 Introduction

The FASB considers earnings information and its components as the primary focus of financial statements (FASB 1978, SFAC No. 1). The assumption that earning is a premier source of firm-specific information is supported by empirical studies (Biddle et al. 1995; Francis et al. 2003; Liu and Wysocki 2007). However, earnings calculation is affected by various accounting methods, predictions and estimates. Consequently, earnings quality and the quality of financial reporting in general are subjects that have attracted much attention and are the centre of debate for investors, regulators as well as scholars in the recent years.

The accounting literature on earnings quality currently embraces various aspects of earnings quality concept. A variety of earnings quality definitions leads to the use of diverse measures of earnings quality. The FASB Conceptual Framework points to the usefulness of accounting information as the benchmark for assessing the quality of financial statements. According to the SFAC No.2 (*Qualitative Characteristics of Accounting Information*) (FASB, 1980) "the primary qualities of accounting information are relevance and reliability, and that to be useful; information must possess both of those qualities".

Most studies on the measurement of earnings quality have usually focused on one dimension of the qualitative characteristics of accounting information. Some

of them focus on relevance of earnings information with decision making. These studies usually use predictive value of earnings (e.g., Barth et al. 2001; Mikhail et al. 2003; Cohen 2004), feedback value (e.g., Radziah, 2009) and persistence of earnings (e.g., Bernstein and Wild 2000; Beneish and Vargus 2002; Penman and Zhang 2002; Skinner 2004; Revsine et al. 2008) as proxies for earnings quality. Other studies focus on reliability of earnings information as a proxy for earnings quality. They measure the reliability of earnings by using various criteria, which encompass smoothness of earnings (e.g., Hunt et al. 2000; Bowen et al. 2003; Leuz et al. 2003; Tucker and Zarowin 2006), abnormal accruals (e.g., Lee 2004; Aboody et al. 2005; Biddle et al. 2008), and the relationship between accruals and cash flows (e.g., Dechow and Dichev 2002; Myers et al. 2003; Balsam et al. 2003; Francis 2005). In these studies, the measurement of earnings quality is incomplete because they assess one dimension of accounting information quality, relevance or reliability.

Accounting information quality is specified by the FASB from the perspective of usefulness to the users in decision-making. This study considers quality of earnings from the FASB viewpoint and defines earnings quality as the extent to which reported earnings capture both dimensions of the qualitative characteristics of accounting information, relevance and reliability. Consequently, the eight earnings quality attributes are characterized as either 'relevance-based' or 'reliability-based' to capture earnings information quality. Predictive value, feedback value, persistence, and timeliness are considered to be relevance-based. Abnormal accruals, smoothness of earnings, conservatism, and accruals quality are regarded as reliability-based. Moreover, prior studies (e.g., Ball and Brown

1968; Lev 1989; Lev and Zarowin 1999; Vafeas 2000; Barth et al. 2001) suggest that earnings information is reflected in the returns of stock when it is useful to investors in investment decisions. Therefore, the study uses the earnings quality attributes' association with stock return to test whether the quality of earnings is reflected in investors' decision making.

Using the pooled least squares method with a fixed effects specification in both cross-section and period, the study finds that first, all earnings quality attributes but one are associated with the returns of stock in the predicted way; the exception is conservatism. This finding is consistent with the findings of prior studies (e.g., Barua 2006; Chan et al. 2006; Ghaemi et al. 2008). The results suggest that the quality of earnings improves the usefulness of earnings information for decision making. Second, investigation of relative importance for relevance or reliability shows that relevance-based earnings quality attributes explain more of the stock returns variation than do reliability-based earnings quality attributes. This finding specifies that investors in the decision making process prefer more relevance than reliability in the earnings information which is consistent with the findings of Barua (2006) and the CFA's assertion (CFA[8] Institute, 2007). Third, among relevance-based attributes, persistence of earnings is the most valued earnings quality attribute. Fourth, among the reliability-based earnings quality attributes, the results show that the largest effect is for accruals quality which is consistent with those obtained by Francis et al. (2005).

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The rest of the paper is structured as follows: Section 2 explains the background of the study and develops the research hypotheses. Section 3 describes earnings quality constructs and measures. The sample, research design, and methodology are explained in section 4. Empirical results are given in section 5. Section 6 concludes the paper.

3.2 Background and Hypotheses

The literature suggest that the returns-earnings association can be used to measure usefulness of accounting information (e.g., Ball and Brown 1968; Lev 1989; Lev and Zarowin 1999; Vafeas 2000; Barth et al. 2001). These studies find the decline in returns-earnings association, since such association reflects consequences of investors' actions to earnings information, it can be interpreted as a decline in usefulness of accounting information. Atiase and Tse (1986) and Holthausen and Verrecchia (1988) propose that information quality may have an impact on the usefulness of accounting earnings. Moreover, there is considerable evidence that abnormal returns are positively associated with an unexpected increase in earnings (e.g., Latane and Jones, 1979; Bernard and Thomas, 1989; Foster, Olsen and Shevlin, 1984).

Association between stock returns and earnings or total accruals relates to the informativeness[9] of accrual-based earnings (Hermanns, 2006). Higher informativeness to investors means higher quality earnings which relates to the value-relevance of earnings. However, the relationship between earnings and stock return is expected to vary, depending on earnings quality, particularly

[9]Warfield et al. (1995) define informativeness as the capacity to explain stock returns.

whether earnings surprise reflects an earnings manipulation by managers or real improvement in profitability.

A review of the literature indicates that many authors and researchers have applied accruals as an important indicator of earnings quality. Some studies find that stocks with high accruals have lower returns (Sloan, 1996; Collins and Hribar, 2000; Houge and Loughran, 2000; Xie, 2001). One interpretation of these results is that large positive accruals reflect earnings manipulation by managers.

Jones (1991) improves a model to separate the components of accruals as discretionary and nondiscretionary accruals. Subramanyam (1996) and Xie (2001), using Jones' model, find that discretionary accruals are useful to predict stock returns, but the nondiscretionary accruals does not. Chan et al. (2006), using different methods, find a similar result on the UK data. They examine whether or not earnings quality is informative for future stock returns by using accruals as a measure of earnings quality. According to Sloan (1996), they find a negative relationship between future stock returns and accruals.

Khajavi and Nazemi (2005) and Panahian and Ramezani (2008) find that accrual does not affect the average stock returns in the TSE, which is inconsistent with the findings of previous studies on the USA and UK Stock Exchange (e.g., Sloan, 1996; Collins and Hribar, 2000; Houge and Loughran, 2000; Xie, 2001; and Chan et al., 2006). Contrary to the findings of Khajavi and Nazemi (2005) and Panahian and Ramezani (2008), Ghaemi et al. (2008) find that the stock returns in the TSE are affected by accruals magnitude and its components.

A review of the literature about earnings quality reveals that a few studies examine the relationship between earnings quality and stock returns, in which they have usually used accruals as a measure of earnings quality. In specific, the study on the Tehran Stock Exchange (Khajavi and Nazemi, 2005; Panahian and Ramezani, 2008; Ghaemi et al., 2008) indicates that different results might be due to the use of different methods to measure accruals quality. Several authors have used accruals (total accruals or discretionary accruals) as proxies for earnings quality, arguing that active earnings management involves high levels of discretionary accruals. They hypothesize that the quality of earnings increases when the level of discretionary accruals is lower. However the level of discretionary accruals as a proxy for earnings management is just one aspect of earnings quality.

Many studies show that accounting earnings provide useful information to predict future stock returns. They take quantity of net income and ignore the quality of earnings in their studies. However, the effect of earnings information on stock returns is expected to vary, depending on the quality of earnings. Moreover, studies on stock return and earnings quality focuses on a single measure of earnings quality. In fact, each attribute of earnings quality assesses a single element of relevance or reliability of earnings information. Consequently the literature may not provide a complete picture of stock return behaviour. In this respect, this paper examines whether the qualitative characteristics of accounting earnings influence stock returns. It is expected that, if investors correctly price earnings quality, it affects stock price and returns by reducing the level of risk as well as expected rate of return. As a result, this study hypothesizes that stock

return is positively associated with the qualitative characteristics of earnings information.

Relevance and reliability are the two primary qualities that make earnings information useful for decision making. By focusing on the primary quality characteristics of accounting information, the main hypothesis can be extended into two hypotheses as follows:

H1: Stock return is positively associated with relevance-based earnings quality attributes.

H2: Stock return is positively associated with reliability-based earnings quality attributes.

According to the conceptual framework of FASB (1980), to be relevant, accounting information should enhance decision makers' capacities to predict or modify earlier expectations or both as well as information should be available to users in a timely manner. Furthermore, more persistence of earnings is better indicator of future earnings and cash flows, and so can be more relevant information for equity valuation (Dechow et al. 2010). Using these indicators, the H1 hypothesis is extended into the following four hypotheses:

H1A: Stock return is positively associated with the predictive value of earnings.

H1B: Stock return is positively associated with the persistence of earnings.

H1C: Stock return is positively associated with the feedback value of earnings.

H1D: Stock return is positively associated with the timeliness of reported earnings.

The FASB Conceptual Framework, state that "Accounting information is reliable to the extent that users can depend on it to represent the economic conditions or events that it purports to represent". (SFAC No. 2, paragraph 62). Extant studies have used accruals as a measure of earnings reliability. Chan et al. (2006) argue that earnings quality may reflect managerial intent to mislead investors. They show that managers sometimes manipulate accruals to manage reported earnings. The function of earnings management leads to the higher application of abnormal (discretionary) accruals. Therefore, abnormal accruals are actually a representative for earnings management. Moreover, earnings smoothing has often considered as an earnings management instrument. Managers by manipulating accruals smooth reported earning over time because they believe that lower variable earnings are preferred by investors (Levitt, 1998). Furthermore, conservatism in earnings recognition decreases managers' incentive to increase accounting earnings through earnings management (Chen et al. 2007). Therefore, using these variables as the measures of earnings reliability, the H2 hypothesis can be extended into four hypotheses as follows:

H2A: Stock return is negatively associated with the abnormal accruals.

H2B: Stock return is negatively associated with the smoothness of earnings.

H2C: Stock return is positively associated with the conservatism.

H2D: Stock return is positively associated with the accruals quality.

The FASB Conceptual Framework in SFAC No. 2 states that degrees of relevance and reliability can vary. If either of two primary qualities is completely missing, the information will not be useful. However, the SFAC No.2 mentions

that reliability and relevance often impinge on each other. Barua (2006) find that reaction of investors is higher for relevance than reliability of earnings information. It suggests that investors have a preference for decision relevance over reliability. This is consistent with the CFA's assertion (CFA Institute, 2007). Therefore, this study also investigates which earnings quality dimension is more important from the decision-usefulness viewpoint and tests the following hypothesis. According to Barua (2006), the study expects significant difference in investors' preferences between earnings relevance and earnings reliability.

H3: Explanatory powers of relevance-based and reliability-based earnings quality attributes on stock returns are significantly different.

3.3 Earnings Quality Constructs and Measures

In the literature on earnings quality, there are different studies that often focus on just one earnings quality attributes. Therefore, there is a variety of definitions leading to a multitude of earnings quality measures in the literature, among them, accruals quality has received much attention as an important indicator related to earnings quality. However, there is no generally accepted method of earnings quality measurement (Hermanns, 2006).

The FASB and IASB (International Accounting Standards Board) specify accounting information quality from the perspective of usefulness to the users when making economic decisions. The Statement of Financial Accounting Concepts (SFAC) No. 2 (FASB, 1980) explains that "the primary qualities of accounting information are relevance and reliability, and that to be useful; information must possess both of those qualities". Therefore, this study considers

the earnings quality constructs from the FASB viewpoint, which encompass both primary determinants of earnings quality; relevance-based and reliability-based attributes.

3.3.1 Relevance-Based Earnings Quality Attributes

This study considers four attributes of earnings quality to assess the relevance of earnings information. They are predictive value of earnings, persistence of earnings, feedback value of earnings and timeliness.

3.3.1.1 Predictive Value

The FASB's concepts statement No. 2 (Para. 51) states that "information can make a difference to decisions by improving decision makers' ability to predict". Since predicted earnings provide useful information about future cash flows and dividend, stock market performance demonstrates a strong focus on earnings predictability.

Following previous studies (e.g., Lipe 1990; Francis et al., 2004), this paper measures predictive value of earnings for each firm-year as the absolute value of the residual from the regression model as follows:

$$NPBA_{j,t} = \alpha_{0,j} + \beta_{1,j} NPBA_{j,t-1} + \varepsilon_{j,t}$$

Where $NPBA_{j,t}$ is firm_j's net profit before abnormal items in year_t scaled by average total assets. In order to convert this variable to a direct measure of predictive value, this study uses the negative of the absolute value of the residual,

PV= $-|\varepsilon_{j,t}|$ so that large (small) values of PV imply more (less) predictability of earnings.

3.3.1.2 Persistence

Persistence is viewed as the extent to which earnings performance persists into the next period. Persistence of earnings is considered to be one of the qualitative attributes of earnings from the perspective of value-relevance (e.g., Bernstein and Wild, 2000; Penman and Zhang, 2002; Beneish and Vargus, 2002; Richardson, 2003; Revsine et al., 2008). Schipper and Vincent (2003) suggest that investors consider a higher persistence of earnings as sustainable, more permanent, and less transitory earnings. Early studies by Kormendi and Lipe (1987), Collins and Kothari (1989), and Easton and Zmijewski (1989) indicate that more persistent earnings have a stronger stock price response.

Following previous research (e.g., Lev, 1983; Ali and Zarowin, 1992; Francis et al., 2004), the study measures earnings persistence as the slope coefficient (β1) from the autoregressive (AR1) model of current year's earnings against last year's earnings ($NPBA_{j,t} = \alpha_{0,j} + \beta_{1,j} NPBA_{j,t-1} + \varepsilon_{j,t}$). Values of $\beta_{1,j}$ close to 1 or more show highly persistent earnings and earnings quality, while values of $\beta_{1,j}$ close to 0 or negative $\beta_{1,j}$ imply less persistent and highly transitory earnings.

3.3.1.3 Feedback Value

The FASB's conceptual framework explains that "feedback value refers to the ability of information to influence decisions by confirming or correcting earlier expectations of decision-makers" (SFAC No. 2, para.51). Barua (2006) considers

the feedback value of earnings to be the ability of current earnings to modify future predictions about earnings and cash flows.

SFAC No.1 states that "one of the main objectives of accounting earnings is to predict the timing, amount and uncertainty of future cash flows" (FASB, 1978, para, 37). Cash flow prediction plays a critical role in investment decisions. Investors need information about future cash flow because their investment is the present value of the future cash flows that will be created by the firm in which they invest. Furthermore, the power of a firm to generate earnings and cash flow is reflected in the market value of its equity. Given that, predicting future earnings and cash flow helps to predict stock return which is a fundamental factor in selecting optimal investment portfolios. Therefore, feedback value of earnings in cash flow prediction and returns prediction are considered to measure the feedback value in this study.

The feedback value is estimated using two prediction models in three steps. Following Barua (2006), the first step is to assess the prediction error of $firm_j$ in $year_{t+1}$ by using earnings in $year_t$ ($PEA_{j,t+1}$). This indicates the prediction error of next year's earnings after considering current year's earnings. The second step is to assess the prediction error of $firm_j$ in $year_{t+1}$ based on predicted earnings of $year_t$, by the use of actual earnings of $year_{t-1}$ ($PEB_{j,t+1}$). This indicates the prediction error of next year's earnings before considering current year's earnings. In the third step, the feedback value of earnings for each firm-year is estimated as the difference between the absolute value of prediction errors for the next year's cash flows and returns before and after considering current year's earnings.

The feedback value of earnings in cash flows prediction (FVCF) is derived by using cash flows prediction model ($CFO_{j,t+1} = \alpha_{0_{j,t}} + \beta_{1,j} NPBA_{j,t} + \varepsilon_{j,t}$). The feedback value of earnings in returns prediction (FVR) is derived by using return prediction model ($RET_{j,t+1} = \alpha_{0_{j,t}} + \beta_1 NPBA_{j,t} + \beta_2 \Delta NPBA_{j,t} + \varepsilon_{j,t}$).

Table 3.1: Measuring feedback value

Panel A: feedback value of earnings in cash flows prediction (FVCF)

Step 1	Step 2
$PCFO_{j,t+1} = \alpha_{0_{j,t}} + \beta_{1,j} NPBA_{j,t}$ $PEA_{j,t+1} = CFO_{j,t+1} - PCFO_{j,t+1}$	$PNPBA_{j,t} = \alpha_{0_{j,t}} + \beta_1 NPBA_{j,t-1}$ $PCOF\_B_{j,t+1} = \alpha_{0_{j,t}} + \beta_1 PNPBA_{j,t}$ $PEB_{j,t+1} = CFO_{j,t+1} - PCFO\_B_{j,t+1}$
Step 3: $FVCF_{j,t} = \lvert PEB_{j,t+1} \rvert - \lvert PEA_{j,t+1} \rvert$	

Panel B: feedback value of earnings in returns prediction (FVR)

Step 1	Step 2
$PRET_{j,t+1} = \alpha_{0_{j,t}} + \beta_1 NPBA_{j,t} + \beta_2 \Delta NPBA_{j,t}$ $PEA_{j,t+1} = RET_{j,t+1} - PRET_{j,t+1}$	$PNPBA_{j,t} = \alpha_{0_{j,t}} + \beta_1 NPBA_{j,t-1}$ $PRET\_B_{j,t+1} = \alpha_{0_{j,t}} + \beta_1 PNPBA_{j,t} + \beta_2 \Delta NPBA_{j,t}$ $PEB_{j,t+1} = RET_{j,t+1} - PRET\_B_{j,t+1}$
Step 3: $FVR_{j,t} = \lvert PEB_{j,t+1} \rvert - \lvert PEA_{j,t+1} \rvert$	

Notes: $NPBA_{j,t}$ is firm$_j$'s net profit before abnormal items in year$_t$; $PNPBA_{j,t}$ is predicted NPBA$_{j,t}$. $CFO_{j,t+1}$ is firm$_j$'s cash flows from operations in year$_{t+1}$, which is calculated as NPBA$_{j,t+1}$-$TA_{j,t+1}$. $TA_{j,t+1}$(total accruals)[10] $= \Delta CA_{j,t+1} - \Delta CL_{j,t+1} - \Delta CASH_{j,t+1} + \Delta STDEBT_{j,t+1} - DEPN_{j,t+1}$. $\Delta CA_{j,t+1}$is firm$_j$'s change in current assets from year$_t$ to year$_{t+1}$. $\Delta CL_{j,t+1}$ is firm$_j$'s change in current liabilities from year$_t$ to year$_{t+1}$. $\Delta CASH_{j,t+1}$ is firm$_j$'s change in cash from year$_t$ to year$_{t+1}$; $\Delta STDEBT_{j,t+1}$ is firm$_j$'s change in short-term debt from year$_t$ to year$_{t+1}$; $DEPN_{j,t+1}$ is firm$_j$'s depreciation and amortization expense in year$_{t+1}$. $PCFO_{j,t+1}$ is predicted $CFO_{j,t+1}$; $PCOF\_B_{j,t+1}$= predicted $CFO_{j,t+1}$ based on predicted NPBA$_{j,t}$. $FVCF_{j,t}$ is firm$_j$'s feedback value of earnings in cash flow prediction for year$_t$. *PEB* is Prediction error of next year's earnings before considering current year earnings. *PEA* is Prediction error of next year's earnings after considering current year earnings. $RET_{j,t+1}$ is firm$_j$'s return in year$_{t+1}$; $PRET_{j,t+1}$ is predicted $RET_{j,t+1}$; $PRET\_B_{j,t+1}$ is predicted return based on predicted NPBA$_{j,t}$; $FVR_{j,t}$ is firm$_j$'s feedback value of earnings in returns prediction for year$_t$.

[10]- This study uses the indirect method because statements of cash flows data are less complete than income statement and balance sheet data.

If the absolute value of the prediction error of next year earnings after considering current year earnings is less than the absolute value of the prediction error before considering current year earnings, it suggest positive feedback value of earnings. Therefore, the large (small) value of the feedback value indicates high (low) earnings quality.

3.3.1.4 Timeliness

Timeliness refers to the availability of accounting information to users before it loses its capacity to influence decisions (FASB, 1980). In this study, timeliness is measured by the reporting lag, in term of days, from the end of the fiscal year to the actual earnings announcement date (Lee, 2004; Velury and Jenkins, 2006; Mahmud et al., 2009). According to TSE regulations, listed firms must issue their annual financial statements to the Stock Exchange and shareholders within four months (124 days) after the end of their financial year. Therefore, in order to decrease scale bias, the reporting lag is deflated by 124 days.

$$T_{j,t} = \frac{EAD_{j,t} - EFY_{j,t}}{124}$$

Where,

$T_{j,t}$ =firm$_j$'s timeliness of reported earnings in year$_t$.

$EAD_{j,t}$ = earnings announcement date.

$EFY_{j,t}$ =firm$_j$'s end of fiscal year in year$_t$.

124 = maximum reporting lag allowed (four month after end of fiscal year).

If the reporting lag ratio is 1, it implies that the firm has a reporting lag of 124 days. A lag ratio less than 1 implies that the earnings are announced in a timely manner. However, to be consistent with other direct measures, this study takes the negative of the T as the direct measure of timeliness.

3.3.2 Reliability-Based Earnings Quality Attributes

Reliability is the extent to which information is verifiable, representationally faithful, and neutral (FASB, 1980). Extant studies usually use abnormal accruals and accruals quality as a measure of earnings reliability. The accruals component of earnings is affected by management judgments, estimates, and allocations of cash flow realization from current earnings in other periods. It may be influenced by biases in by estimators' estimates and judgments, resulting in less reliable information through misrepresentation of economic phenomena. Consequently, accruals quality plays a critical role in determining the reliability of earnings information to users. Based on these arguments, four earnings quality criteria are considered as measures of the reliability of earnings information which is related to accruals. These are abnormal accruals, smoothness of earnings, earnings conservatism and accruals quality.

3.3.2.1 Abnormal (Discretionary) Accruals

This approach relies on accounting fundamentals to separate accruals into normal and abnormal components. According to Ronen and Yaari (2008), abnormal accruals (discretionary accruals) are accruals that "arise from transactions made or accounting treatments chosen in order to manage earnings".

Therefore, abnormal accruals reflect earnings manipulation by management (earnings management) which is an inverse measurement of earnings quality.

In accounting literature, the Jones approach (1991) has been widely used to measure abnormal accruals. Jones takes into account changes in revenue and gross value of property, plant, and equipment to control the economic conditions on the accruals level. Kothari et al. (2005) argue that firm performance is correlated with accruals. They include ROA (ratio of return on assets) as an additional independent variable in the discretionary accrual regression. This study follows this method and measure abnormal accruals for each firm-year as the absolute value of residuals from the regression model as follows:

$$TA_{j,t} = \alpha_{0_{j,t}} + \beta_1 \Delta REV_{j,t} + \beta_2 PPE_{j,t} + \beta_3 ROA_{j,t} + \varepsilon_{j,t}$$

Where,

$TA_{j,t}$ = $firm_j$'s total accruals in $year_t$.

$\Delta REV_{j,t}$= $firm_j$'s change in revenue from $year_{t-1}$ to $year_t$.

$PPE_{j,t}$ = $firm_j$'s property, plant and equipment in $year_t$.

$ROA_{j,t}$ =$firm_j$'s return on assets in $year_t$ measured as net profit before abnormal items for $firm_j$ in $year_t$ divided by average total assets in $year_t$.

ABAC (abnormal accruals) =$|\varepsilon_{j,t}|$.

Large (small) values indicate more (less) abnormal accruals and less (more) earnings quality.

3.3.2.2 Conservatism

Ball and Shivakumar (2006) argue that conservatism in accounting earnings has important role in determining the quality of earnings. White et al. (2003) consider earnings quality as the extent of conservatism in a firm's reported earnings. Chen et al. (2007) argue that conservatism in accounting may limit earnings management because it reduces managers' incentive to increase accounting earnings through earnings manipulation.

Basu (1997) employs the ratio of bad news response to good news response as the measure of conservatism. However, Dietrich, Muller and Riedl (2007) and Givoly, Hayn and Natarajan (2007) have criticized the measurement as not always capturing conservatism. Givoly and Hayn (2000) use the magnitude of accruals as an alternative; they argue that more negative accruals, on average, are the indicator of conservatism. Following to Givoly and Hayn (2000), conservatism is measured as the magnitude of accruals.

$$Cons = NPBA_{j,t} + \mathrm{DEPN}_{j,t} - CFO_{j,t}$$

Variables are as previously defined.

3.3.2.3 Smoothness

Earnings smoothing is the reduction of volatility in reported earnings over time. Therefore, smoothed earnings are sometimes lower and sometimes higher than actual earnings. Earnings smoothing can be either 'genuine' or 'artificial'. Artificial smoothing involves decisions that affect accruals since management

reduce volatility of earnings by manipulating in accruals, while genuine smoothing involves decisions that affect cash flows (Goel and Thakor, 2003).

Earnings smoothing is a special case of earnings management (earnings manipulation). Accruals are used in earnings smoothing by managers which leads to a reduction in the reliability of accruals. Managers smooth out transitory fluctuations by using their private knowledge about future earnings (Chaney and Lewis 1995; Demski, 1998). Trueman and Titman (1988) suggest that managers affect investors' perceptions by smoothing earnings. Smoothness in earnings also encourages uninformed investors to enter the market (Goel and Thakor, 2003).

Following Bowen et al. (2003) and Boonlert (2004), smoothness of earnings is measured as the ratio of the firm-level standard deviation of operating cash flows to the standard deviation of earnings.

$$Smooth_{j,t} = \frac{\sigma\,(\mathrm{CFO_{j,t}})}{\sigma\,(\mathrm{NPBA_{j,t}})}$$

Where,

$\sigma\,(CFO_{j,t})$ = $\mathrm{firm_j}$'s standard deviation of operating cash flows in$\mathrm{year_t}$.

$\sigma\,(NPBA_{j,t})$ = $\mathrm{firm_j}$'s standard deviation of net profit before abnormal items in $\mathrm{year_t}$.

Ratios of more than 1 indicate less variability in earnings relative to the variability of operating cash flows which provide evidence suggesting the use of accruals to smooth earnings. Therefore, large (small) values of smoothness ratio

show more (less) earnings smoothness which is an inverse measure of earnings quality.

3.3.2.4 Accruals Quality

Since accruals shift the recognition of cash flows from current period to future, they provide useful information about future cash flows. Accruals quality is considered to be the degree of stability in the relationship between accruals and cash flows. The present study follows the model developed by Dechow and Dichev (2002) to estimate accruals quality. It matches between realization of operating cash flows and working capital accruals. A strong match indicates high quality of accruals and earnings.

$$WCAC_{j,t} = \alpha_{0_{j,t}} + \beta_1 CFO_{j,t-1} + \beta_2 CFO_{j,t} + \beta_3 CFO_{j,t+1} + \varepsilon_{j,t}$$

Where:

$WCAC_{j,t}$ = firm$_j$'s current working capital accruals inyear$_t$.

$WCAC_{j,t} = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta CASH_{j,t} + \Delta$STDEBT$_{j,t}$; all other variables are as previously defined.

The residual reflects the variation in total current accruals unexplained by cash flows of the previous, current and subsequent periods. Therefore, the absolute value of the residuals for each firm-year is an inverse measure of accruals quality. This study uses the negative value of the standard deviation of residuals, ACCQ (accruals quality) $= -|\varepsilon_{j,t}|$, so that large and small values indicate high and low accruals quality respectively.

3.4 Research Design and Methodology

3.4.1 Sample Selection

This study is based on annual observations over the period from 1998 to 2009. Since, measurement of some variables requires changes in working capital, average total assets, and past and future cash flows from operations, this restricts the sample period of this study. Consequently, actual empirical tests are based on a 9-year period (2000-2008). These periods were selected because in Iran the first set of accounting declarations was published in 1999.

The sample data consists of accounting and market data. Accounting data comprises audited financial statements which are used to estimate earnings quality attributes as independent variables. Market data includes stock price which is applied to calculate stock returns as a dependent variable. Control variables are measured with the use of both kinds of data. All data is obtained from the database of the Tehran Stock Exchange, the database of the Mabna Company and the Tehran Stock Exchange Economic Research Centre for the sample period. The Mabna database provides more detailed financial statement data and covers more firm year's observations for the investigation periods. For these reasons it was used as a main source of raw data, and in some cases the Tehran Stock Exchange Economic Research Centre and the database of the Tehran Stock Exchange were used to complete missing data.

The samples were selected according to the following criteria:

1. The companies must have completed data for all variables such as balance sheets and income statements.

2. The fiscal year of the companies must have ended on March 21st (the year end in the Iranian calendar). The fiscal year for most companies ends on March 21st and the reason for excluding non-March fiscal year end firms is to ensure that data for all firms can be compared.

3. Firms must have been accepted in the TSE before 1998 and are continuously listed on the Tehran Stock Exchange main board in the studied period.

4. The stock of the companies should have been traded in the periods of study.

To be consistent with previous studies, financial sector firms including investment companies, commercial banks, financial companies and insurance companies were excluded from the sample because their financial statements structure is different from other firms. Additionally, firms that were involved in a listing which resulted from long-term suspension, delisting or failure are not included because their financial statements reported stockholders' equity values less than zero.

After screening data based on these, the sample includes 1632 annual (firm-year) observations for 136 active listed firms over the twelve-years. The process of sample selection and the distribution of selected firms based on industries are shown in Table 3.2, Panels A and B.

Table 3.2: Sampling selection

Panel A: The Process of Sample Selection

The process of sample selection	No. of firms	Number of annual observation
Accepted firms before 1998	254[11]	3048
Investment and financial firms	(12)	(144)
Firms with different fiscal year or changed their end of financial year date during the period of study	(27)	(324)
Non-active firms	(11)	(132)
Delisting firms during the period of study	(68)	(816)
Number of selected firms/Firm- year observation	136	1632

Panel B: Distribution of Selected Firms Based on Industry

Sector	No. of companies	%
Motor Vehicles And Auto Parts	17	12.5
Pharmaceuticals	15	11.0
Cement, Lime and Gypsum	13	9.6
Chemicals and By-products	12	8.8
Food and Beverages	12	8.8
Other Non-metallic Mineral Products	11	8.1
Basic Metals	9	6.6
Machinery and Equipment	7	5.1
Metal Products	6	4.4
Sugar and By-products	6	4.4
Ceramic and Tile	5	3.7
Rubber and Plastic Products	5	3.7
Electric Machinery and Apparatus	5	3.7
Others	13	9.6
Total	136	100

11-Number of listed active firms in 2009 was 338 firms.

3.4.2 Data Analysis Method

In analysing collected data, the pooled data regression method was applied to estimate the relationship between independent and dependent variables. These methods provide greater degrees of freedom, more observations with more variability and less collinearity among the variables, and more efficiency (Hsiao, 2003). Another advantage of the pooled data method is the ability to control for individual heterogeneity. In this study, collected data are from different industries and also the use of data over a 9 year period includes different economic conditions. Therefore, the fixed effects estimation method was used in both cross-section and period. In this method, slopes are constant but the intercept term varies among both across sections and over time. The differences in the intercepts may be due to unique features of each firm, such as managerial talent or management style. It controls for the underlying time and cross-section variant heterogeneity among firms. Furthermore, this study specifies the fixed effect with robust standard errors by using White's (1980) Period method. This method overcomes the potential problems of heteroscedasticity due to the scale differences (Christie, 1987).

To avoid problems of heteroscedasticity, all accounting numbers, which are used in measuring earnings quality, are scaled by average of total assets.

3.4.3 Research Models

The research is designed to investigate the relationship between the qualitative characteristics of accounting earnings and stock returns by using the following multiple regression models:

$$RET_{i,t} = \beta_{0i,t} + \beta_1 Size_{i,t} + \beta_2 BM_{i,t} + \beta_3 Beta_{i,t} + \beta_4 EQ(relevance)_{i,t}^{k} + \varepsilon_{i,t} \quad (1)$$

$$RET_{i,t} = \beta_{0i,t} + \beta_1 Size_{i,t} + \beta_2 BM_{i,t} + \beta_3 Beta_{i,t} + \beta_4 EQ(reliability)_{i,t}^{k} + \varepsilon_{i,t} \quad (2)$$

$$RET_{i,t} = \beta_{0i,t} + \beta_1 Size_{i,t} + \beta_2 BM_{i,t} + \beta_3 Beta_{i,t} + \Sigma\beta_4 EQ(relevance)_{i,t}^{k} + \Sigma\beta_5 EQ(reliability)_{i,t}^{k} + \varepsilon_{i,t} \quad (3)$$

Where,

RET= the 12 month return ending four months after the ending of the financial year.

Size = *Log* (Total Assets)

BM=Book value of equity/Market value of equity

Beta= Cov (Stock Returns, Market Returns)/Var (Market Returns)

$EQ(relevance)_{i,t}^{k}$ = the kth earnings quality attribute in year t, k includes predictive value (PV), persistence of earnings (PERS), feedback value of earnings in cash flow prediction (FVCF), feedback value of earnings in returns prediction (FVR) and timeliness (T).

$EQ(reliability)_{i,t}^{k}$ = the kth earnings quality attribute in year t, k includes abnormal accruals (ABACC), conservatism (CONS), smoothness of earnings (SM) and accruals quality (ACCQ).

Models 1 and 2 are considered to measure effects of relevance-based and reliability-based earnings quality attributes individually on stock returns. Model 3 encompasses all earnings quality attributes. It is used to assess the incremental contribution of each attribute, in the presence of the others, to explain stock

returns. All the relevance-based attributes, the conservatism (CONS) and the accruals quality (ACCQ) are considered as direct measures of earnings quality, while the abnormal accruals (ABACC) and the smoothness of earnings (SM) are inverse measures of earnings quality. Positive coefficients for direct measures of earnings quality indicate that high quality of earnings will lead to high stock returns. With regard to inverse measures of earnings quality (ABACC and SM), negative coefficients imply that as earnings quality increases, stock returns will increase and vice versa.

Fama and French (1992) show that the variation of cross-sectional stock returns can be captured by size and book-to-market equity ratio. Francis et al. (2004) find that with controlling size, book-to-market equity ratio, and beta factors, earnings quality adds significantly to the explanation of variation in returns. Accordingly, in order to control for factors affecting stock return that are unrelated to earnings quality attributes, this study includes size, book-to-market equity ratio, and beta in the models.

3.5 Empirical Results

3.5.1 Descriptive Statistics

The descriptive statistics of the variables over the period of the study, 2000 to 2008, are reported in Table 3.3. The mean (median) for return (RET) is 0.391(0.203). The high return mean is due to high inflation in the period of study in Iran's economy. The mean (median) of size is 5.315 (5.269). The maximum and minimum sizes are 7.145 and 4.186 respectively. The mean (median) of book-to-market equity ratio (BM) is 0.517 (0.436). It implies that market value of stock

is higher than book value. In addition, the maximum and minimum BM ratios are 2.132 and 0.027 respectively. The mean (median) of beta (systematic risk) is 0.229 (0.06). The maximum and minimum betas are 3.799 and –2.818 respectively. Mean value of beta is roughly similar to the value of 0.227 that was reported by Wong (2009), for a sample of Australian stock exchange (ASX) listed companies including 1534 firm-year observations from 1992 to 2006.

The predictive value of earnings (the negative of the absolute value of the prediction error of the current year's earnings), which captures the ability of past earnings to predict current earnings, has a mean (median) value of -0.0520 (-0.037). Persistence (PERS), which captures the extent to which earnings performance persists into the next period, has a mean (median) value of 0.659 (0.675). In comparison, the average of earnings persistence reported by Baginski et al. (1999) for 162 listed firms on New York Stock Exchange with a complete series of data from 1967-1990 is 0.54 and Francis et al. (2004) report descriptive data implying a mean (median) earnings persistence coefficient of 0.482 (0.520).

With regard to the feedback value of earnings in cash flows prediction (FVCF) and stock returns prediction (FVR), the means (medians) are 0.002 (0.001) and 0.004 (0.019) respectively. This indicates that the difference between the absolute prediction error before considering last year's earnings (PEBi,t) is slightly larger than the absolute prediction error after considering last year's earnings (PEAi,t). This finding also suggests that the feedback value of earnings in return prediction (FVR) is higher than the feedback value of earnings in cash flow prediction (FVCF). Finally, timeliness (the negative of the reporting lag ratios) has a mean

(median) value of -0.8 (-0.863). This indicates that reporting lag on average is around 99 days (0.8*124)[12]. This is considered timely reporting since it is within the maximum duration allowed by the Tehran Stock Exchange.

With respect to the four earnings quality attributes, which capture components of the reliability of earnings, abnormal accrual (ABACC) has a mean (median) value of 0.071 (0.055). Conservatism, as the negative of changes in current accruals, has a mean (median) value of -0.065 (-0.063). Smoothness, which captures the variability of cash flows relative to the variability of income, has a mean (median) value of 1.980 (1.432). This implies that the variability of income relative to the variability of cash flows is around 0.50. In comparison, Hunt et al. (2000) and Francis et al. (2004) report descriptive data, for U.S. firm, implying a mean ratio of income volatility to cash volatility of 0.51 and 0.64 respectively. Leuz et al. (2003) report a mean ratio of income volatility to cash volatility of 0.765 (for all U.S. firm-year observations, 1990-1999). Finally, the accruals quality measure (the negative value of the standard deviation of estimated residuals from the match between realization of operating cash flow and working capital accruals) has a mean (median) value of -0.037 (-0.027). In comparison, Dechow and Dichev (2002) report a mean (median) accrual quality measure of 0.028 (0.020) for their sample of 1752 firms over 1987-1999 for U.S. firms and Francis et al. (2004) report descriptive data implying a mean (median) accrual quality measure of 0.026 (0.019).

[12] According to TSE regulations, listed firms must issue their annual financial statements to the Stock Exchange and shareholders within four months (124 days) after the end of their financial year.

Table 3.3: Descriptive statistics[13]

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
RET	0.391	0.203	3.085	-0.565	0.696
SIZE	5.315	5.269	7.145	4.186	0.557
BM	0.517	0.436	2.132	0.027	0.355
BETA	0.229	0.060	3.799	-2.812	1.181
PV	-0.052	-0.037	0.000	-0.252	0.050
PERS	0.659	0.675	1.087	0.020	0.218
FVCF	0.002	0.001	0.147	-0.132	0.044
FVR	0.004	0.019	1.593	-1.471	0.471
T	-0.800	-0.863	-0.323	-1.074	0.178
ABACC	0.071	0.055	0.292	0.001	0.062
CONS	-0.065	-0.063	0.300	-0.386	0.124
SMO	1.980	1.432	7.986	0.461	1.505
ACCQ2	-0.037	-0.027	0.000	-0.190	0.035

Notes: RET= Returns of stock; SIZE=Log (Total Assets*j, t-1*); BM= Book-to-Market Equity Ratio; BETA= systematic risk; PV=Predictive Value; PERS=Persistence of Earnings; FVCF=Feedback Value of Earnings in Cash Flows Prediction; FVR= Feedback Value of Earnings in Returns Prediction; T = Timeliness; ABACC = Abnormal Accruals; CONS = Conservatism; SM= Smoothness of Earnings and ACCQ = Accruals Quality

[13] The descriptive statistics of the variables includes 1224 firm-year observations, representing 136 active listed firms over the nine-years.

3.5.2 Correlation Analysis

In this study, Pearson's correlation coefficient is applied to statistically measure the relationship between all pairs of variables. The coefficient presents both the strength and direction of association between a pair of variables. If there is no association between the dependent and each of the independent variables, the regression model should not be conducted. However, a strong correlation between a pair of independent variables implies multicollinearity problem.

Table 3.4 presents the correlation between the stock return, control variables and earnings quality attributes. It is noted that small firms seem to be more profitable for shareholders as the correlation between size and returns is negative and significant. Book-to-market equity ratio (BM) and beta have positive and significant correlation with stock returns. With regard to the earnings quality attributes, return (RET) is positively and significantly correlated with persistence of earnings (PERS), feedback value of earnings in return prediction (FVR), timeliness (T), and conservatism (CONS) while the correlation between predictive value of earnings (PV) and stock returns is negative and significant. Meanwhile, the correlation between return and feedback value of earnings in cash flows prediction (FVCF), abnormal accruals (ABACC) and accruals quality (ACCQ) is positive but not significant.

Among the control variables, there is significant and negative correlation between book-to-market equity ratio (BM) and size whereas the correlation between beta and size is positive and significant. It implies that large firms have lower market value of stock and higher systematic risk than small firms. The

correlation between beta and book-to-market equity ratio (BM) is negative and significant.

With regard to the control variables and earning quality attributes, there is significant and positive correlation between size and predictive value (PV), timeliness (T), abnormal accruals (ABACC), smoothness (SM), and accruals quality (ACCQ). Based on the table, book-to-market equity ratio (BM) is negatively and significantly correlated with persistence of earnings (PERS), timeliness (T) and smoothness (SM), while the correlation between BM and predictive value (PV), conservatism and accruals quality (ACCQ) is positive and significant. The correlation between beta and persistence of earnings (PERS) is positive and significant.

Among the earnings quality attributes, predictive value (PV) is positively and significantly correlated with conservatism, smoothness and accruals quality, while the correlation between PV with persistence and timeliness is negative and significant. This indicates that conservatism, smoothness and accruals quality improves the predictability of reported earnings. There is significant and positive correlation between persistence of earnings (PERS) with feedback value of earnings in cash flows prediction (FVCF) and timeliness (T) whereas the correlation between persistence of earnings (PERS) with conservatism (CONS), smoothness (SM) and accruals quality (ACCQ) is negative and significant.

The correlations among the relevance-based attributes are generally small (i.e., 0.169 or less), as well as all four reliability-based attributes exhibit significant correlations exceeding 0.18. The correlation between the relevance-based

attributes and ABACC, CONS and SM are less than 0.23. The correlation between PV and ACCQ is relatively large in economic terms at 0.399. These results suggest relatively little overlap between the relevance-based and the reliability-based earnings quality attributes. This finding indicates that the two types of earnings quality attributes measure different aspect of earnings quality. Moreover, within each of these sets of earnings quality attributes, the correlations across the different measures are not so strong as to specify that any attribute subsumes another. This indicates that the eight earnings attributes are distinct constructs. Furthermore, with respect to correlation between variables, the correlation matrix confirms that there is no collinearity and multicollinearity[14] problem since none of the variables correlates above ±0.80 (see Gujarati, 2003). All correlation coefficients are less than ±0.40.

[14] Collinearity refers to issues which derive from having a correlation between two independent variables (Hair et al., 1998). Multicollinearity is a result of the relationship between more than two independent variables (Hair et al., 1998). Basically, collinearity and multicollinearity can be recognized by measuring the correlation between a pair of the variables. The presence of a high correlation between independent variables (0.90 and above) is an important indicator of substantial collinearity (Hair et al., 1998). Bryman and Cramer (1997, p.257) consider 0.80 correlation instead of 0.90.

Table 3.4: Correlation coefficients among sample variables, (2000-2008).

Correlation / Probability	RETURN	SIZE	BM	BETA	PV	PERS	FVCF	FVER	TIMELY	ABACC	CONS	SM	ACCQ
RET	1												

SIZE	-0.178	1											
	0.000	-----											
BM	0.053	-0.078	1										
	0.065	0.006	-----										
BETA	0.091	0.132	-0.089	1									
	0.002	0.000	0.002	-----									
PV	-0.005	0.100	0.153	0.040	1								
	0.854	0.001	0.000	0.159	-----								
PERS	0.283	0.014	-0.338	0.083	-0.099	1							
	0.000	0.637	0.000	0.004	0.001	-----							
FVCF	0.046	0.047	-0.042	-0.007	-0.013	0.066	1						
	0.110	0.100	0.140	0.818	0.648	0.020	-----						
FVR	0.330	-0.010	0.010	0.040	0.007	0.018	0.012	1					
	0.000	0.721	0.723	0.161	0.814	0.531	0.685	-----					
T	0.067	0.050	-0.187	0.013	-0.078	0.169	0.033	0.010	1				
	0.019	0.083	0.000	0.650	0.007	0.000	0.255	0.739	-----				
ABACC	0.001	0.049	-0.034	0.010	-0.032	-0.025	0.017	-0.014	0.027	1			
	0.979	0.088	0.231	0.726	0.257	0.382	0.557	0.628	0.345	-----			
CONS	0.048	0.028	0.066	0.005	0.065	-0.056	-0.006	-0.034	0.008	0.057	1		
	0.092	0.331	0.021	0.870	0.022	0.051	0.829	0.238	0.776	0.046	-----		
SM	-0.056	0.149	-0.053	0.030	0.195	-0.235	0.005	0.026	0.008	0.183	-0.049	1	
	0.048	0.000	0.062	0.297	0.000	0.000	0.850	0.370	0.778	0.000	0.084	-----	
ACCQ	0.008	0.067	0.074	-0.017	0.399	-0.063	0.051	0.000	-0.010	-0.056	0.065	0.160	1
	0.771	0.019	0.010	0.547	0.000	0.028	0.072	0.992	0.717	0.049	0.024	0.000	-----

Notes: RET= Returns of stock; SIZE=Log (Total Assets); BM= Book-to-Market Equity Ratio; BETA= systematic risk; PV=Predictive Value; PERS=Persistence of Earnings; FVCF=Feedback Value of Earnings in Cash Flows Prediction; FVR= Feedback Value of Earnings in Returns Prediction; T = Timeliness; ABACC = Abnormal Accruals; CONS = Conservatism; SM= Smoothness of Earnings and ACCQ = Accruals Quality

3.5.3 Main Tests and Results

Table 3.5, Panel A shows the results of assessing a base model version of Equation (1) that comprises only the control variables (i.e., it excludes the earnings quality attributes). This regression provides a validation of study's stock returns estimates. It is expected that these estimates to be negatively related to Size (large firms have lesser stock returns), and positively related to BM and beta (firms with higher book-to-market equity ratio (BM) and systematic risk (beta) have higher stock returns). The coefficients of control variables are in the predicted sign.

The negative coefficient for size of -1.386 (t-statistic =-7.8) signifies that firms with larger size have smaller stock returns than firms with smaller size. These findings are consistent with the evidence provided by Bagella et al. (2000). Himmelberg et al. (1999) argue that since top management, in small firms, has control over their strategic and operational activities within the firm, it is expected that small firms to be more efficient than the larger firms.

The positive coefficient for the book-to-market equity ratio (BM) indicates that stock returns in firms with larger BM ratios are higher than for firms with smaller BM ratios (coefficient=0.545, t=5.164). This is consistent with the results obtained by Chan et al. (1991), Chui and Wei (1998), Daniel et al. (2001) and Barua (2006). The positive coefficient for beta of 0.073 (t-statistic =3.059) confirms that risk has a positive association with stock returns in Tehran Stock Exchange. In other words, firms with larger systematic risk have higher stock

returns than firms with smaller systematic risk which is consistent with Barua (2006) and Sinaee and Moradi (2010).

Panel B of Table 3.5 shows the results of estimating Equation (1) adding, individually, earnings quality attributes that include specified components of the relevance of earnings information in SFAC No. 2. It is expected that the coefficient estimate for each earnings quality attribute will be positive, $\beta_4 > 0$, indicating higher stock returns for companies with higher earnings quality attributes.

The association between the predictive value of earnings (PV) and stock returns is tested by Hypothesis 1A. It is expected that predictive value (PV) is positively associated with stock return. The results show that the association between predictive value of earnings (PV) and stock returns is significant with a positive sign at the 10% level (coefficient of β_4= 0.88, t-statistic = 1.956). A positive coefficient for PV indicates that high predictability of earnings, as a measure of earnings quality, will lead to high stock returns.

Hypothesis 1B relates to the test of whether persistence of earnings (PERS) is positively associated with stock return. The results show that positive coefficient between persistence of earnings (PERS) and stock returns is statistically significant as expected. It has the highest coefficient and large t-statistic values (coefficient=1.935, t=7.447). Therefore, this finding suggests that earnings quality in terms of persistence of earnings has a positive association with stock returns. It suggests that investors in the stock market are more concerned about persistence of earnings.

Hypothesis 1C relates to the association between feedback value of earnings and stock returns. To measure the feedback value of earnings, this study applies two attributes including feedback value of earnings in cash flows prediction (FVCF) and feedback value of earnings in returns prediction (FVR). It is expected that FVCF and FVR are positively associated with stock returns. According to the results, coefficient of β_4= 1.025, t-statistic = 1.939 for FVCF and coefficient of β_4= 0.505, t-statistic = 13.129 for FVR, confirm that there is a positive and significant association between feedback value and stock returns. Comparison of these results indicates that the next largest effect after PERS is found for FVCF. This finding suggests that feedback value has a positive and significant association with stock returns.

The association between timeliness (T) and stock returns is tested by Hypothesis 1D. It is expected that there is a positive association due to the fact that timeliness (T) is measured by the negative reporting lag ratio. Results in Table 3.5, Panel B confirm that there is a positive and significant association between the negative of reporting lag ratio and stock returns, indicating that a low reporting lag ratio which reflects high earnings quality will bring about high stock returns.

In addition, the explanatory power, as indicated by adjusted R^2, is between 25% and 37%. When comparing the adjusted R^2 between the five attributes (Panel B of Table 3.5), the feedback value of earnings in return prediction (FVR) and predictive value of earnings (PV) models provide a higher and lower value of adjusted R^2 than the others respectively. This suggests that the power of the FVR

attribute to explain stock returns variation is greater than that of the others attributes.

This study performs the same analyses for earnings quality attributes that encompass reliability components of earnings information; results are shown in Panel C of Table 3.5. The base model results are identical to those presented in Panel A of Table 3.5. Panel C shows the results of estimating Equation (2) by adding, individually, each of the earnings quality attributes that include elements of the reliability of accounting earnings to the base model. As explained, conservatism and accruals quality are regarded as direct measures of earnings quality whereas abnormal accruals and smoothness of earnings are inverse measures of earnings quality. Considering this, it is expected that the coefficient estimate on conservatism and accruals quality is positive, $\beta_4 > 0$, indicating higher returns of stock for firms with better outcomes of the attribute. With regard to abnormal accruals and smoothness of earnings, a negative coefficient is expected.

The Hypothesis 2A tests the relationship between abnormal (discretionary) accruals (ABACC) and stock returns. According to the statistical results, coefficient of β_4=-0.748, t-statistic = -2.131, in Panel C of Table 3.5, for pooled regression analysis, there is a significant association between abnormal accruals and stock returns. Additionally, the coefficient is negative and in the expected sign, indicating that abnormal accruals which reflect earnings management (earnings manipulation) will lead to low stock returns. Consequently, Hypothesis 2A is accepted.

The Hypothesis 2B involves testing the association between conservatism and stock returns. It is expected that conservatism is positively associated with stock returns. The statistical results (coefficient of β_4= 0.171, t-statistic = 1.074) show that conservatism has a positive sign but is not significant.

The association between smoothness of earnings (SM) and stock returns is tested by Hypothesis 2C. It is expected that there is a negative association due to the fact that earnings smoothing is a special case of earnings management (earnings manipulation). Results in Panel C of Table 3.5, coefficient of β_4= -0.079, t-statistic = -3.536, confirm that there is a negative association between earnings smoothing and stock returns indicating that smoothness of earnings which reflects low earnings quality will bring about low stock return. Consequently, the result allows the study to accept Hypothesis 2C.

Finally, Hypothesis 2D is used to test whether accruals quality (ACCQ) is positively associated with stock returns. According to the results, β_4= 1.140, t-statistic = 1.940, this study accepts the hypothesis which confirms that accruals quality (ACCQ) has a positive association with stock returns.

In addition, when comparing the adjusted R^2 between the four attributes (Table 3.5, Panel C); the adjusted R^2 in all attributes is around 25%. This suggests that 25% of the variation in the stock returns can be explained by the variables specified in the models.

Table 3.5:

Results of Cross-Sectional and Time-Series Regressions of Returns of Stock on Control Variables (Risk Proxies) and Earnings Quality Attributes[15]

$$RET_{i,t} = \beta_{0_{i,t}} + \beta_1 Size_{i,t} + \beta_2 BM_{i,t} + \beta_3 Beta_{i,t} + \varepsilon_{i,t}$$

Panel A: Base Model Regression Results

variables	Coef.	t-stat.
Intercept	7.461	7.749 ***
SIZE	-1.386	-7.800 ***
BM	0.545	5.164 ***
BETA	0.073	3.059 ***
Adj. R^2	0.244	
F-Stat.	3.698	
D.W	2.051	
No. of observations: 1224 included: 136	Cross-sections	

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: SIZE=Log (Total Assets*j, t-1*); BM= Book-to-Market Equity Ratio; BETA= systematic risk;

[15] This study estimates the cross-sectional & time series relation between stock returns, and control variables which is known as risk factors (Size, BM, and Beta) and the earnings quality attributes considered individually. It reports the coefficient estimates; t-statistics are based on the White period standard errors & covariance (d.f. corrected). Panel A shows results for the relationship between stock returns, and control variables (excluding earnings quality attributes). Panel B shows results for the relevance-based earnings quality attributes considered individually, and Panel C shows results for the reliability-based earnings quality attributes considered individually.

Size = Log(Total Assets)

BM=Book value of equity/Market value of equity

Beta= Cov(Stock Returns, Market Returns)/Var(Market Returns)

Table 3.5 (continued)

Panel B: Base Model, Plus Relevance-Based Attributes Considered Separately

$$RET_{i,t} = \beta_{0i,t} + \beta_1 Size_{i,t} + \beta_2 BM_{i,t} + \beta_3 Beta_{i,t} + \beta_4 EQ(relevance)_{i,t}^{k} + \varepsilon_{i,t} \quad (1)$$

variables	H1A Predictive Value		H1B Persistence		H1c				H1D Timeliness	
					Feedback value in cash flows prediction		Feedback value in return prediction			
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Intercept	7.509	7.866***	4.092	3.997***	7.546	7.822***	7.629	8.579***	7.775	8.061***
SIZE	-1.385	-7.865***	-1.007	-5.942***	-1.403	-7.874***	-1.418	-8.600***	-1.387	-7.779***
BM	0.532	5.075***	0.695	6.343***	0.548	5.241***	0.550	6.119***	0.550	5.171***
BETA	0.071	2.981***	0.072	3.289***	0.073	3.111***	0.055	2.786***	0.070	2.941***
Attribute	0.880	1.956*	1.935	7.447***	1.025	1.939*	0.505	13.129***	0.389	2.666***
Adj. R^2	0.246		0.309		0.247		0.366		0.248	
F-Stat.	3.716***		4.715***		3.729***		5.811***		3.738***	
D.W	2.034		2.148		2.057		1.874		2.049	
No. of observations: 1224 Cross-sections included: 136										

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: SIZE=Log (Total Assets*j, t-1*); BM= Book-to-Market Equity Ratio; BETA= systematic risk;

Table 3.5 (continued)

Panel C: Base Model, Plus Reliability-Based Attributes Considered Separately

$$RET_{i,t} = \beta_{0i,t} + \beta_1 Size_{i,t} + \beta_2 BM_{i,t} + \beta_3 Beta_{i,t} + \beta_4 EQ(reliability)_{i,t}^{k} + \varepsilon_{i,t} \quad (2)$$

variables	H2A AB-ACCRUALS		H2B CONSERVATISM		H2C SMOOTHNESS		H2D ACCRUALS QUALITY	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Intercept	7.594	7.851***	7.380	7.711***	7.562	8.115***	7.482	7.760***
SIZE	-1.402	-7.868***	-1.369	-7.742***	-1.375	-7.954***	-1.382	-7.750***
BM	0.548	5.214***	0.541	5.116***	0.530	5.014***	0.542	5.160***
BETA	0.072	3.067***	0.072	3.018***	0.072	3.031***	0.073	3.077***
Attribute	-0.748	-2.131**	0.171	1.074	-0.079	-3.536***	1.140	1.940*
Adj. R^2	0.247		0.244		0.250		0.245	
F-Stat.	3.725***		3.682***		3.779***		3.704***	
D.W	2.044		2.050		2.061		2.048	
No. of observations: 1224					Cross-sections included: 136			

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: SIZE=Log (Total Assets*j, t-1*); BM= Book-to-Market Equity Ratio; BETA= systematic risk;

3.5.4 Robustness Analysis

The study assesses the incremental contribution of each attribute, in the presence of the others, to explain stock returns with the use of estimating Equations (1 and 2). Table 3.6 reports the results for the relevance-based earnings quality attributes (Model 1), the reliability-based earnings quality attributes (Model 2), and all earnings quality attributes (Model 3). The results of estimating Model 1 show that all variables are consistently significant with a positive sign. Among all relevance-based attributes, earnings persistence has the largest pricing effects β_4= 1.630 (t-statistic = 6.884). Controlling for other relevance-based attributes, Model 1 also shows that the coefficients estimate for FVCF and FVR are β_4= 0.877, t-statistic = 1.944, and β_4= 0.469, t-statistic=12.509 respectively. In the presence of the other relevance-based earnings quality attributes, the estimated coefficients and related t-statistics increase for predictive value of earnings and decrease for timeliness. Specifically, in Table 3.6 predictive value (PV) has a coefficient estimate of 1.082 (t-statistic = 2.656), compared to 0.88 (t-statistic = 1.956) in Panel B of Table 3.5, and the coefficient for timeliness (T) is 0.212 (t-statistic = 1.755) versus 0.389 (t-statistic = 2.666) in Table 3.5, Panel B.

The results of estimating Model 2 reveal that abnormal accruals (ABCC), smoothness (SM) and accruals quality (ACCQ) are distinctly priced reliability-based earnings quality attributes. Accruals quality has the largest pricing effects, β_4=1.140, t-statistic =1.940. However, conservatism is consistently insignificant. These results are broadly similar to those for the reliability-based earnings quality attributes, reported one at a time in Table 3.5, Panel C.

Results including the control variables and all earnings quality attributes are reported in the last columns of Table 3.6 (Model 3). In the presence of the relevance-based earnings quality attributes, conservatism is significantly related to stock returns with a positive sign. Therefore, all variables are statistically significant and in the expected sign and other results are broadly similar to those reported for Models 1 and 2. The results in Model 3 show that the largest effect is for persistence of earnings (β_4= 1.608, t-statistic = 6.812), followed by feedback value of earnings in cash flows prediction (β_4= 0.955, t-statistic = 2.120), accruals quality (β_4= 0.848, t-statistic = 1.739), predictive value of earnings (β_4= 0.839, t-statistic = 2.116), abnormal accruals (β_4= -0.627, t-statistic = -1.972), feedback value of earnings in returns prediction (β_4= 0.47, t-statistic = 12.679), conservatism (β_4= 0.289, t-statistic = 1.857), timeliness (β_4= 0.2, t-statistic = 1.656) and smoothness (β_4= -0.056, t-statistic = -2.561). Smoothness of earnings and beta have relatively modest effects compared to the effects of other attributes, and the returns of stock effects of reliability-based earnings quality attributes are generally smaller than those of relevance-based attributes.

These results are interpreted as broadly supporting the main hypothesis and inferences that the study drew from considering the earnings quality attributes one at a time, in Table 3.5, Panels B and C.

Table 3.6: Results of Cross-Sectional and Time-Series Regressions of Returns of Stock on Control Variables (Risk Proxies) and both Relevance-Based and Reliability-Based Earnings Quality Attributes[16] Considered Jointly

$$RET_{i,t} = \beta_{0\,i,t} + \beta_1 Size_{i,t} + \beta_2 BM_{i,t} + \beta_3 Beta_{i,t} + \beta_4 EQ(relevance)_{i,t}^{k} + \varepsilon_{i,t} \quad (1)$$

$$RET_{i,t} = \beta_{0\,i,t} + \beta_1 Size_{i,t} + \beta_2 BM_{i,t} + \beta_3 Beta_{i,t} + \beta_4 EQ(reliability)_{i,t}^{k} + \varepsilon_{i,t} \quad (2)$$

$$RET_{i,t} = \beta_{0\,i,t} + \beta_1 Size_{i,t} + \beta_2 BM_{i,t} + \beta_3 Beta_{i,t} + \Sigma\beta_4 EQ(relevance)_{i,t}^{k} + \Sigma\beta_5 EQ(reliability)_{i,t}^{k} + \varepsilon_{i,t} \quad (3)$$

Independent variables	Variables	Expected sign	MODEL 1		MODEL 2		MODEL 3	
			Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
	Intercept		5.081	5.256***	7.642	8.254***	5.166	5.427***
Control variables	SIZE	-	-1.109	-6.895***	-1.372	-7.996***	-1.087	-6.944***
	BM	+	0.664	7.247***	0.528	5.025***	0.648	7.151***
	BETA	+	0.053	2.870***	0.071	3.021***	0.052	2.819***
Relevance-based attributes	PV	+	1.082	2.656***			0.836	2.116*
	PERS	+	1.630	6.884***			1.608	6.812***
	FVCF	+	0.877	1.944*			0.955	2.120**
	FVR	+	0.469	12.509***			0.470	12.679***
	TIMELY	+	0.212	1.755*			0.200	1.656*
Reliability-based attributes	ABACC	-			-0.758	-2.174**	-0.627	-1.972**
	CONS	+			0.143	0.864	0.289	1.857*
	SM	-			-0.073	-3.179***	-0.056	-2.561***
	ACCQ	+			1.086	1.815*	0.848	1.739*
Adj. R^2			0.421		0.255		0.429	
F-Stat.			6.885***		3.786***		6.937***	
D.W			1.926		2.052		1.932	
No. of observations: 1224					Cross-sections included: 136			

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: SIZE=Log (Total Assets*j, t-1*); BM= Book-to-Market Equity Ratio; BETA= systematic risk; PV=Predictive Value; PERS=Persistence of Earnings; FVCF=Feedback Value of Earnings in Cash Flows Prediction; FVR= Feedback Value of Earnings in Returns Prediction; Timely = Timeliness; ABACC = Abnormal Accruals; CONS = Conservatism; SM= Smoothness of Earnings and ACCQ = Accruals Quality.

[16] The study estimates the cross-sectional & time series relation between stock returns, and control variables which is known as risk factors (Size, BM, and Beta) and the earnings quality attributes considered jointly. It reports the coefficient estimates; t-statistics are based on the White period standard errors & covariance (d.f. corrected). Model 1 demonstrates results for the set of relevance-based earnings quality attributes: Model 2 demonstrates results for the set of reliability-based earnings quality attributes; and Model 3 shows results for all earnings quality attributes.

3.5.5 Relative Importance for Relevance or Reliability

Tests of the incremental explanatory power of the relevance-based earnings quality attributes and of the reliability-based earnings quality attributes are shown in Table 3.7. These results indicate that both sets of attributes add significantly to each other as well as to the control variables (risk proxies) in explaining cross-sectional and time series variation in the returns of stock. In particular, the relevance-based attributes add a value of 21.65 percentage points in explanatory power, reliably different from zero at 1% significant level. The incremental explanatory power provided by the reliability-based earnings quality attributes is smaller, 2.3 percentage points (t-statistic = 2.527). The difference in incremental R^2 provided by relevance-based attributes versus reliability-based attributes is compared in Table 3.7 (Model 2 versus Model 1). The result is consistent with Hypothesis 3 which indicates relevance-based attributes provide significantly more explanatory power than do reliability-based attributes. This result suggests that investors prefer more relevance than reliability in earnings information which is consistent with the CFA's assertion (CFA Institute, 2007).

Table 3.7: Tests of Incremental Explanatory Power[17]

Comparison of explanatory variable	Inc. R^2	t-stat.
Model 3 versus Model 2 (incremental of relevance-based attributes)	0.21653	7.854***
Model 3 versus Model 1(incremental of reliability-based attributes)	0.02373	2.527**
Model 2 versus Model 1	0.1928	3.358***

***significant at 1%, ** significant at 5%,

[17] Each year, the study estimates the incremental explanatory power of the relevance-based earnings quality attributes (Model 3 versus Model 2) and of the reliability-based earnings quality attributes (Model 3 versus Model 1). The mean incremental explanatory power is computed across the 9 yearly estimates, along with t-statistics of whether that means difference is reliably different from zero. The Paired-Samples T-Test procedure is used to compare the means of R2.

3.6 Conclusions

This study draws several inferences from the results of the pooled regression tests presented in Tables 3.5, 3.6 and 3.7. In respect to control variables, the negative coefficient for size signifies that firms with larger size have smaller stock returns than firms with smaller size which is consistent with the evidence provided by Bagella et al. (2000). Moreover, the positive coefficient for the book-to-market equity ratio (BM) indicates that stock returns in firms with larger BM ratios are higher than for firms with smaller BM ratios. This is consistent with the results obtained by Chan et al. (1991), Chui and Wei (1998), Daniel et al. (2001) and Barua (2006). The positive coefficient for beta confirms that risk has a positive association with stock returns in Tehran Stock Exchange.

In relation to earnings quality, first, when considered individually, all earnings quality attributes but one are associated with the returns of stock in the predicted way; the exception is conservatism where the study finds no reliable associations. Second, comparisons of incremental explanatory power show that relevance-based earnings quality attributes explain more of the stock returns variation than do reliability-based earnings quality attributes. Third, among relevance-based earnings quality attributes, persistence of earnings is the most priced earnings quality attribute, followed by predictive value of earnings, feedback value of earnings in cash flows prediction, feedback value of earnings in returns prediction and timeliness. Fourth, among the reliability-based earnings quality attributes, the results show that the largest effect on stock returns comes from accruals quality followed by abnormal accruals, conservatism and smoothness.

The overall results suggest that stock returns have a positive association with earnings quality. The results are consistent with the findings of Barua (2006), Chan et al. (2006), and Ghaemi et al. (2008) and inconsistent with Khajavi and Nazemi (2005) and Panahian and Ramezani (2008) due to the use of different methods for measuring earnings quality criteria and the adoption of different periods and statistical methods.

Evidence on the effects of earnings quality on stock returns has practical value for accounting information users. It provides guidelines to investors, financial analysts, standard setters, regulators, and other accounting information users by enhancing their perception of earnings quality and its effect on stock returns. With respect to investors and financial analysts, the results of this study could be applied to increase investment returns through reflection of earnings quality attributes in financial analysis and investment decisions. With respect to researchers, the results suggest that, to capture all information about earnings quality in future studies, a focus on both dimensions of the qualitative characteristics of accounting information (reliability and relevance) is required, as specified in the FASB's conceptual framework. With respect to accounting standard setters, the results suggest that they have to be concerned about financial statement quality, especially income statements, which are necessary for the usefulness of accounting earnings information in the decision making process. Finally, the results of this study can be used by the Tehran Stock Exchange (TSE) to increase the earnings quality by setting policies and regulations about the quality of financial information reporting. Improvements in the quality of earnings reporting will not only enhance the confidence of investors by reducing the level

of risk, but also will add impetus to the growth and efficiency of capital markets in Iran.

Chapter 4

The Effect of Earnings Quality on the Value-Relevance of Accounting Information

4.1 Introduction

The value-relevance of accounting information has long been a contentious issue, among both practitioners and researchers, and has important policy implications. The usefulness of accounting information in equity valuation is argued from the perspective of value-relevance. The importance of value-relevance is emphasized by FASB in considering the usefulness of accounting information as the primary objective of financial statements (FASB 1978).

The value-relevance of accounting information is considered as the ability of accounting numbers to reflect information used by investors in the equity valuation process (Collins et al., 1997; Francis and Schipper, 1999; Hung, 2001). Earnings and book value provide useful information about the firm's performance and financial position which are relevant information in valuing a firm's equity. Some studies demonstrate the relative priority of accounting earnings over other accounting items in predicting stock returns (Wilson 1986; Beaver and Dukes 1972; Dechow 1994). However, studies on the relative value-relevance of book value and accounting earnings state that investors shifts their reliance from accounting earnings to equity book value in the valuation process (Barth et al., 1998; Collins et al., 1999; Ou and Sepe, 2002; Whelan and McNamara, 2004).

Prior researchers have found conflicting results about trends in the value-relevance of accounting information. Many studies document that the value-relevance of accounting information has declined in recent years (Lev and Zarowin, 1999; Ely and Waymire, 1999; Francis and Schipper, 1999; Graham et al., 2000; Ho et al., 2001; Core et al., 2003; Marquardt and Wiedman, 2004; Thinggaarda and Damkierb, 2008), whilst others have identified an increase (e.g. Gjerde et al., 2007; Dung, 2010; Filip, 2010).

Earnings quality, as measured by high relevance and high reliability of earnings information, may increase the usefulness of earnings information and thus the value-relevance of earnings. However, if the market detects a decline in the usefulness of earnings information it may decide to look for other alternative accounting information as the basis for valuation purposes.

A review of accounting literature shows that many studies investigate earnings-return or price association. They often take quantity of earnings and ignore its quality in their studies. However, it is expected that value-relevance of earnings is variable, depending on whether the reported earnings reflects an earnings with high or low information quality. Considering this, if the market in equity valuation just focuses "on reported income and does not take into account the quality of earnings, there may be temporary deviations of prices away from their correct values" (Chan et al. 2006, p.1042). In addition, a review of the literature indicates that a few studies investigate the effect of earnings quality on the value-relevance of accounting information. Specifically, these studies do not capture all earnings quality information in their research since earnings quality

attributes used in these investigations assess just one aspect of earnings quality, reliability or relevance. As a result, the current literature may not provide a complete picture of the impact of earnings quality on the value-relevance of accounting numbers in valuation of equity.

This study investigates the impact of earnings quality on the relative value-relevance of both accounting earnings and book value of equity as a proxy for the usefulness of accounting information. The study aims to link earnings quality constructs with the equity valuation. In this respect, it studies whether earnings quality constructs are reflected in the value-relevance of accounting information. This is an important issue in the equity valuation, as the incorporation of earnings quality attributes into equity valuation models provides more realistic estimates of firm's value. This study also investigates whether any trend in value-relevance and earnings quality exists over the study period and whether earnings quality, in terms of the reliability and relevance, is associated with the gradual decline in value-relevance of accounting information over time, which has been documented in previous research (e.g. Ely and Waymire, 1999; Lev and Zarowin, 1999; Francis and Schipper, 1999).

The FASB specifies accounting information quality from the perspective of usefulness to the users in decision making which primarily depends on the reliability and relevance of information. Therefore, this study considers quality of earnings from the FASB viewpoint. It defines earning quality as the extent to which reported earnings capture both dimensions of qualitative characteristics of accounting information; relevance and reliability. Consequently, the eight

earnings quality attributes are characterized as either 'relevance-based' or 'reliability-based' to capture earnings information quality. Predictive value, feedback value, persistence, and timeliness are considered to be relevance-based. Abnormal accruals, smoothness of earnings, conservatism, and accruals quality are regarded as reliability-based. The factor analysis method is applied to derive scores of earnings quality. This approach captures the overall score of earnings quality for both dimensions of qualitative characteristics of accounting information, relevance and reliability, which is more effective than any of the single measures.

This study uses a valuation framework provided by Ohlson (1995), which considers the market value of stock as a function of both book values of equity and accounting earnings. The value-relevance is measured by the extent of market's response to the information content of earnings and book value of equity. As investor behaviour in market is reflected in stock prices, the market response is assessed by the response coefficients of earnings and book value in a regression against stock prices or returns (Easton and Harris 1991; Dechow 1994; Sloan 1996; Whelan and McNamara 2004).

Earnings quality is used as the indicator of relevance and reliability of earnings information. It is introduced to the valuation model as an intercept and an interaction dummy variable with both accounting earnings and book value of equity. Consistent with FASB' Conceptual Framework, this study used relevance and reliability of earnings information as a proxy for earnings quality (FASB, 1980). The study estimate pooled cross-sectional and time series regressions for a

9 year period spanning 2000 to 2008 and use the response coefficients on the book value and earnings interaction variables and R^2 as the primary metrics for measuring value-relevance. Then, using a technique described in Theil (1971) and applied by Easton (1985), Collins et al. (1997), and Shamy and Kayed (2005) the combined explanatory power of book value and accounting earnings is disaggregated into three components: "(i) the incremental explanatory power of earnings, (ii) the incremental explanatory power of book values, and (iii) the explanatory power common to both earnings and book values" (Collins et al., 1997, p.40-41).

Using the pooled least squares method with a fixed effects specification in cross-section, the study find that first, both earnings and book value provide relevant information in the valuation process. Second, the valuation models in portfolios of firms with high and low quality earnings confirm that earnings quality information is relevant in valuing a firm's equity. Third, the value-relevance of accounting earnings (book value of equity) in portfolio of firms with high quality earnings is explicitly and significantly higher (lower) than portfolio of firms with low quality earnings. This result confirms that the quality of earnings increases value-relevance of earnings and decreases value-relevance of book value. This suggests that when earnings quality increases, the market may place less reliance on book value and focus more on earnings as a base in the equity valuation process. Fourth, investigation of relative preference between relevance and reliability in the equity valuation process shows that investors prefer more relevance than reliability in the earnings information which is

consistent with the findings of Barua (2006) and the CFA's assertion (CFA[18] Institute, 2007). Fifth, the results also reveal that the value-relevance of earnings has decreased while the value-relevance of book value has remained relatively constant over time. This suggests that changes in the value-relevance of book value could not offset the decline in the value-relevance of earnings, resulting in a decline in the combined value-relevance of two measures. This is inconsistent with the results obtained by Berger et al. (1996), Collins et al. (1997), Barth et al. (1998), Francis and Schipper (1999), and Whelan and McNamara (2004). Sixth, trends analysis of value-relevance and earnings quality over time reveals that a decline in value-relevance of earnings over time can be explained by the decreasing significance of relevance-based earnings quality attributes. Seventh, the results provide further evidence of the effect of size, leverage, firm's performance, systematic risk (beta), operating cycle (OPCYC), and growth on the value-relevance of earnings and book value, as well as evidence of negative earnings (NEPS) effects. Furthermore, the results show that firm size and operating cycle (OPCYC) may explain the shift in value-relevance from earnings to book values. Finally, the results confirm that the quality of earnings information is reflected in investors' decision making in the equity valuation process.

The results of study are robust for the inclusion of the control variables and using disaggregated explanatory power of earning and book value as an alternative measure of value-relevance.

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[18]- Centre for Financial Market Integrity

The present study contributes to the value-relevance literature by linking earnings quality with the equity valuation process and assessing the relative desirability between the value-relevance of earnings and book value. Furthermore, the results highlight the importance of relevance-based earnings quality attributes in improving the usefulness of earnings information in valuing a firm's equity. In addition, the study contributes to the value-relevance literature on the role of earnings quality in changing the value-relevance of earnings over time.

The rest of the paper is structured as follows: Section 2 explains background of study and develops the research hypotheses. Section 3 describes research design. Section 4 presents empirical results. Section 5 concludes the paper.

4.2 Background and Hypotheses

The market's anticipation of firm performance is reflected in the market value of equity. To form these expectations, both book value of equity and earnings provide useful information to the equity market. Book value of equity is a representative of past performance and earnings information is a reliable indicator of future performance. Therefore, these criteria have been used by prior studies, as the basis for evaluation of a firm's equity (e.g. Easton and Harris, 1991; Wild, 1992; Dechow, 1994; Ohlson, 1995; Barth and Kallapur, 1996; Penman, 1998; Easton, 1999; Ou and Sepe, 2002; Whelan and McNamara, 2004; Marquardt and Wiedman, 2004).

Prior studies (e.g., Ball and Brown 1968; Lev and Zarowin 1999; Vafeas 2000; Barth et al. 2001) suggest that earnings information is reflected in the market value of equity when it provides useful information for investors. Since

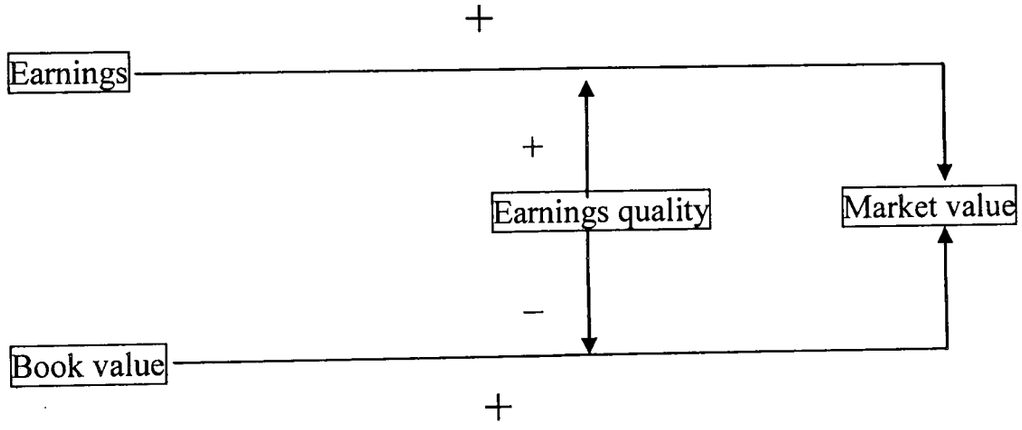
association between earnings and stock prices reflects the consequences of investors' actions, these studies use earnings-return association to evaluate the usefulness of accounting information. They provide evidence suggesting the decline in the usefulness of earnings information. Therefore, the value-relevance of earnings information is based on this argument that, if accounting earnings provide useful information to investors, they will modify their behaviour and the equity market will react through effects on prices and returns. However, if the market detects a decline in earnings quality it may be necessary to focus on book value as the basis for valuation purposes.

Collins et al. (1997) express that the main reasons of the shift in market's reliance from accountings earnings to equity book value are due to an increase in the occurrence of reported losses (Hayn, 1995) and the extent of extraordinary and abnormal items (Elliott and Hanna, 1996), as well as a decrease in firm size (Wild, 1992). These causes, which are associated with a decrease in the value-relevance of accounting earnings in equity valuation, have also proven to be related to an increase in the value-relevance of book value in the valuation process (Berger et al., 1996; Collins et al., 1997; Barth et al., 1998).

The question of which measure (book value of equity or earnings) has the superior value-relevance in determining stock price is an empirical one. However, previous studies find that book value will become more value-relevant when the reliability of earnings is low (Berger et al., 1996; Collins et al., 1997; Burgstahler and Dichev, 1997; Barth et al., 1998; Marquardt et al., 2004; Whelan and McNamara, 2004). Figure 4.1 shows the expected effect of earnings quality on the

association between both book value and earnings with market value. These accounting measures are expected to have a positive relationship with the market value of equity. Since higher quality earnings better capture a firm's underlying economic performance, they should be more useful in helping investors assess firm value. Therefore, it is expected that earnings quality moderates the value-relevance of accounting measures. Particularly, a higher quality of earnings contributes to improving the relevance and reliability of earnings information, thereby increasing the value-relevance of earnings in valuing a firm's equity. When earnings are perceived to be relevant and reliable (high earnings quality), this may lead to a decline in focus on book value as the basis for valuation purposes. Consequently, earnings quality may have a negative effect on the relationship between book value and the market value of equity, resulting a decrease in the value-relevance of book value in equity valuation.

Figure 4.1: The Effect of Earnings Quality in the Valuation Process



As shown in Figure 4.1, earnings quality has a positive effect on the relationship between earnings and the market value of equity. Therefore, value-relevance of earnings is associated with earnings quality and a decline in earnings

quality may reduce the value-relevance of earnings information. Since the earnings information becomes less relevant and less reliable, the market may look for other sources of accounting information as an alternative measure of a firm's value. The book value of equity is an alternate source of accounting information which can be used by investors as a benchmark for equity valuation. Consequently, earnings quality may have a negative effect on the value-relevance of the book value of equity in equity valuation. This hypothesis is formalized as follows:

H1a: The portfolios of firms with high quality earnings (HH) have significantly higher value-relevance of earnings in comparison with the portfolios of firms with low quality earnings (LL).

H1b: The portfolios of firms with high quality earnings (HH) have significantly lower value-relevance of book value in comparison with the portfolios of firms with low quality earnings (LL).

The FASB Conceptual Framework in SFAC No. 2 states that reliability and relevance often impinge on each other. Barua (2006) finds that market responses are higher for relevance than reliability of earnings information. According to Barua (2006), this study expects significant differences in investors' preferences for reliability and relevance of accounting information in equity valuation process. This expectation is formalized as follows, stated in alternative form:

H2a: The portfolios of firms with high relevance and low reliability earnings versus low relevance and high reliability earnings have significantly different value-relevance of earnings.

H2b: The portfolios of firms with high relevance and low reliability earnings versus low relevance and high reliability earnings have significantly different value-relevance of book value

The FASB's Conceptual Framework specifies reliability and relevance of information as key factors in making valuation decisions. There is an integral association between these factors. The value-relevance of earnings will play a relatively more important role in determining stock price when the reliability and relevance of earnings information is high. Barth et al. (2001) argue that to be value-relevant, accounting information must be both relevant and reliable (Barth et al., 2001). Barua (2006) finds the largest value-relevance of earnings in portfolios of firms with high relevance and high reliability (HH) of earnings information. However, he argues that the value-relevance of earnings can be increased by increasing one dimension of accounting information quality (either relevance or reliability). Therefore, it is expected that the value-relevance of accounting information is affected by either high relevance and low reliability earnings (HL) or low relevance and high reliability earnings (LH). However, it is expected that firms in the high quality earnings portfolio (HH) have the largest (smallest) value-relevance of earnings (book value) while firms in the low quality earnings portfolio (LL) have the smallest (largest) value-relevance of earnings (book value) in determining stock price. As a result, two hypotheses are formulated as follows:

H3a: The portfolios of firms with high (low) quality earnings have significantly higher (lower) value-relevance of earnings in comparison with the portfolios of

firms with high relevance & low reliability earnings (HL) and low relevance & high reliability earnings (LH).

H3b: The portfolios of firms with high (low) quality earnings have significantly lower (higher) value-relevance of book value in comparison with the portfolios of firms with high relevance & low reliability earnings (HL) and low relevance & high reliability earnings (LH).

4.3 Research Design and Methodology

4.3.1 Sample Selection

The study sample includes firms listed on the Tehran Stock Exchange. Consistent with prior studies, firms in the financial sector were excluded due to industry-specific regulations and differences in their financial statements structure. The study is based on annual observations over the period 2000 to 2008. The required data consists of accounting data (audited financial statements) and market data (stock price). The related data was obtained from the database of the Tehran Stock Exchange, the database of the Mabna Company and the Tehran Stock Exchange Economic Research Centre for the years 1998 to 2009[19].

After screening data based on the sample selection criteria, the initial sample includes 1632 annual (firm-year) observations for 136 active listed firms over the

[19]This study is based on annual observations over the period from 1998 to 2009. Since, measurement of some variables requires changes in working capital, average total assets, and past and future cash flows from operations, this restricts the sample period of this study. Consequently, actual empirical tests are based on a 9-year period (2000-2008). These periods were selected because in Iran the first set of accounting declarations was published in 1999.

twelve-years. The process of sample selection and the distribution of selected firms based on industries are shown in Table 3.2 (Chapter 3).

4.3.2 Data Analysis Method

The pooled data regression method was applied to estimate the relationship between independent and dependent variables. In this study, collected data are from different industries and also the use of data over a 12 year period includes different economic conditions. Considering this, the fixed effects estimation method was used in both cross-section and period. In this method, slopes are constant but the intercept term varies among both across sections and over time. This approach controls for the underlying time and cross-section variant heterogeneity among firms. The study also uses Wald test to make a formal comparison of the estimated coefficient.

4.3.3 Factor Analysis

Although a various earnings quality metrics are frequently used in the literature, there is no consensus about the 'best' measure of earnings quality. The accounting literature provides several concerns about using each measure as a proxy for earnings quality. One important criticism is that each attributes of earnings quality assess a single element of one dimension of accounting information quality as specified in the conceptual framework of the FASB, and focusing on a single measure may not capture all information about earnings quality. To address this issue the study uses eight earnings quality attributes and conduct factor analysis to construct an index of each earnings quality dimension for each firm-year, by aggregating the common information across the different

measures. This approach is likely to capture the overall level of relevance and reliability of earnings in a firm more effectively than any of the single measures of earnings quality. The factor analysis method has been applied in a number of accounting studies (e.g., Dechow, Sloan and Sweeney, 1996; Bushee, 1998; Lee, 2004; Cohen, Dey and Lys, 2004; Barua; 2006).

A summary of models used to assess components of relevance and reliability of earnings information are summarised in Table 4.1. Details about those models are described in the previous paper.

Earnings quality attributes measuring predictive value, feedback value, persistence of earnings, and timeliness are loaded in factor 1, which are referred as the *Relevance* factor, and variables representing abnormal accruals, conservatism, smoothness of earnings and accruals quality are loaded in factor 2, which are considered as the *Reliability* factor. Subsequently, factor scores are obtained for each factor, which indicate the summary measures of earnings quality in terms of relevance and reliability of earnings information. The derived scores are direct measures of the relevance and reliability, since all variables used in the factor analysis are direct measures of earnings quality.

Predictive value, feedback value, persistence, and timeliness are considered to be direct measures of the relevance of earnings information. Abnormal accruals, smoothness of earnings, conservatism, and accruals quality are regarded as measure of the reliability of earnings information. Conservatism and accruals quality are as direct measures of earnings quality whereas abnormal accruals and smoothness of earnings are inverse measures of earnings quality. However, to be

consistent with other direct measures, in factor analyses the study uses the negative value of abnormal accruals and smoothness of earnings as the direct measure of earnings quality. Since all variables used in the factor analysis are direct measures of earnings quality, the derived scores are also direct measures of the relevance and reliability of earnings information.

According to Barua (2006), derived scores from factor analyses for each dimension are divided into three categories – high, medium and low. Then, observations are classified into four portfolios by using high and low scores: (1) high relevance and high reliability (HH); (2) low relevance and low reliability (LL); (3) high relevance and low reliability (HL); and (4) low relevance and high reliability (LH) (as depicted in Figure 4.2).

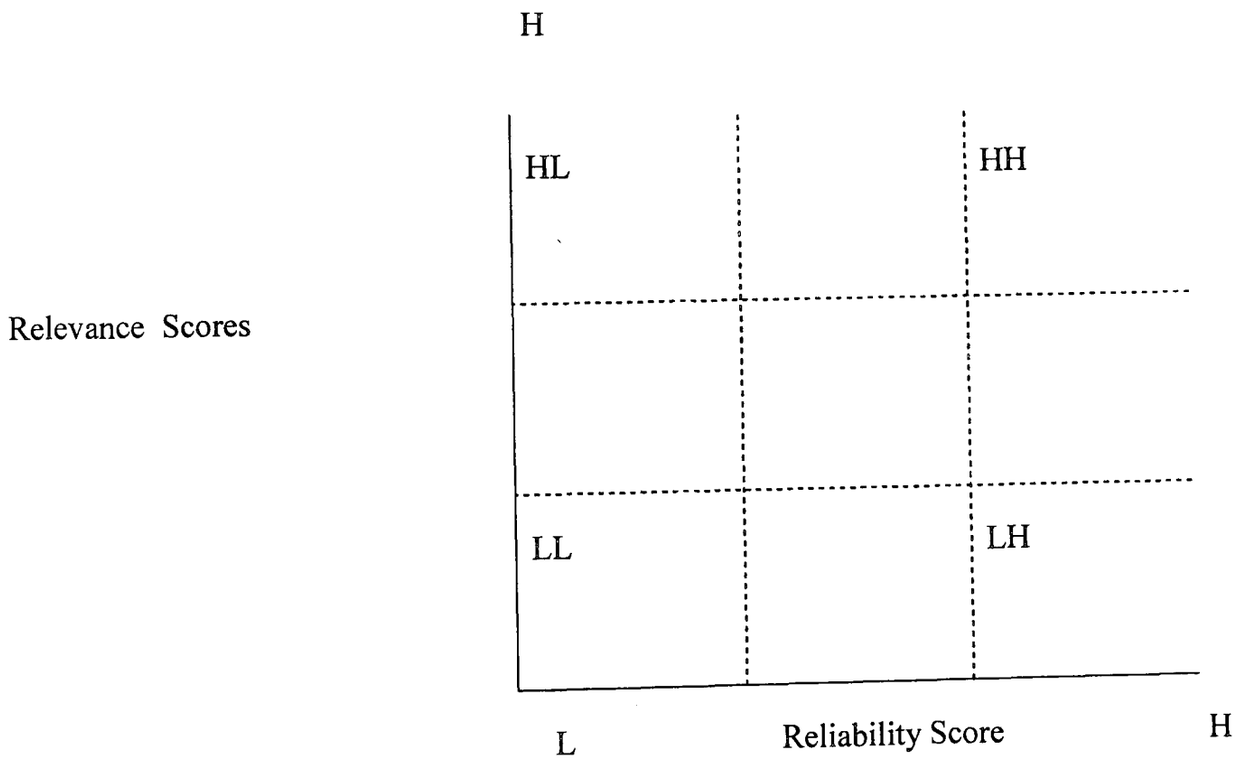


Figure 4.2 Portfolios of Earnings Quality

Observations with high (low) relevance and reliability scores are placed in the HH (LL) portfolio. These portfolios are used to test propositions which relate to compare high and low earnings quality. The HL portfolio includes observations with higher (lower) relevance (reliability) and the LH portfolio comprises firm-years observations with lower relevance and higher reliability. These portfolios are used to test propositions regarding relative preference of relevance and reliability in determining stock price.

Table 4.1: Summary Measure of Earnings Quality Attributes

Relevance	Reliability
1. **Predictive value:** The ability of past year earnings to predict current year earnings. $NPBA_{j,t} = \alpha_{0,j} + \beta_{1,j} NPBA_{j,t-1} + \varepsilon_{j,t}$ $PVE = -\lvert\varepsilon_{j,t}\rvert$ Where, $NPBA_{j,t}$ = Net profit before abnormal items in $year_t$ scaled by average total assets. PVE = Predictive value of earnings 2. **Persistence:** The extent to which earnings performance persists into the next period $NPBA_{j,t} = \alpha_{0,j} + \beta_{1,j} NPBA_{j,t-1} + \varepsilon_{j,t}$ $PERS = \beta_{1,j}$ 3. **Feedback value:** The ability of current earnings to change predictions about future earnings and cash flows. **Step1*:** $PCFO_{j,t+1} = \alpha_{0\,j,t} + \beta_{1,j} NPBA_{j,t}$ $PEA_{j,t+1} = CFO_{j,t+1} - PCFO_{j,t+1}$ **Step 2:** $PNPBA_{j,t} = \alpha_{0\,j,t} + \beta_1 NPBA_{j,t-1}$ $PCOF\_B_{j,t+1} = \alpha_{0\,j,t} + \beta_1 PNPBA_{j,t}$ $PEB_{j,t+1} = CFO_{j,t+1} - PCFO\_B_{j,t+1}$ **Step 3:** $FVCF_{j,t} = \lvert PEB_{j,t+1}\rvert - \lvert PEA_{j,t+1}\rvert$ Where, $CFO_{j,t+1}$** = $firm_j$'s cash flows from operations in $year_{t+1}$, $PCFO_{j,t+1}$= predicted $CFO_{j,t+1}$; $PCOF\_B_{j,t+1}$= predicted $CFO_{j,t+1}$ based on predicted $NPBA_{j,t}$; $FVCF_{j,t}$ = $firm_j$'s feedback value of earnings in cash flow prediction for $year_t$. *PEB*= Prediction error of next year's earnings before considering current year earnings. *PEA*= Prediction error of next year's earnings after considering current year earnings.	1. **Abnormal accruals:** Abnormal accruals reflect earnings management $TA_{j,t} = \alpha_{0\,j,t} + \beta_1 \Delta REV_{j,t} + \beta_2 PPE_{j,t} + \beta_3 ROA_{j,t} + \varepsilon_{j,t}$ Where, $TA_{j,t}$ = $firm_j$'s total accruals in $year_t$. $\Delta REV_{j,t}$= $firm_j$'s change in revenue from $year_{t-1}$ to $year_t$. $PPE_{j,t}$ = $firm_j$'s property, plant and equipment in $year_t$. $ROA_{j,t}$ =$firm_j$'s return on assets in $year_t$ measured as net profit before abnormal items for $firm_j$ in $year_t$ divided by average total assets in $year_t$. ABAC (abnormal accruals) = $-\lvert\varepsilon_{j,t}\rvert$. 2. **Conservatism:** The choice of accounting procedures or estimates that keeps the book values of net assets relatively low. Conservatism= Total accruals + $DEPN_{j,t+1}$ $DEPN_{j,t+1}$= $firm_j$'s depreciation and amortization expense in $year_{t+1}$. 3. **Smoothness:** The reduction of volatility in reported earnings over time $Smooth_{j,t} = \frac{\sigma(CFO_{j,t})}{\sigma(NPBA_{j,t})}$ Where, $\sigma(CFO_{j,t})$ = $firm_j$'s standard deviation of operating cash flows in$year_t$. $\sigma(NPBA_{j,t})$ = $firm_j$'s standard deviation of net profit before abnormal items in $year_t$. All variables are scaled by average total assets.

Table 4.1 (continued)

4. **Timeliness:** The availability of accounting information to users in a timely manner $T_{j,t} = \frac{EAD_{j,t} - EFY_{j,t}}{124}$ Where, $T_{j,t}$ = $firm_j$'s timeliness of reported earnings in $year_t$. $EAD_{j,t}$ = earnings announcement date. $EFY_{j,t}$ = $firm_j$'s end of fiscal year in $year_t$. 124 = maximum reporting lag allowed (four month after end of fiscal year).	4. **Accruals quality:** The degree of stability in the relationship between cash flows and accruals $WCAC_{j,t} = \alpha_{0_{j,t}} + \beta_1 CFO_{j,t-1} + \beta_2 CFO_{j,t} + \beta_3 CFO_{j,t+1} + \varepsilon_{j,t}$ Where: $WCAC_{j,t}$ = $firm_j$'s current working capital accruals in $year_t$. $WCAC_{j,t} = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta CASH_{j,t} + \Delta STDEBT_{j,t}$; All other variables are as previously defined.
In order to avoid problems of heteroscedasticity, all accounting variables are scaled by average total assets.	

Notes: *The first step is to assess the prediction error of $firm_j$ in $year_{t+1}$ by using earnings in $year_t$ ($PEA_{j,t+1}$). The second step is to assess the prediction error of $firm_j$ in $year_{t+1}$ based on predicted earnings of $year_t$, by the use of actual earnings of $year_{t+1}$ ($PEB_{j,t+1}$). In the third step, the feedback value of earnings for each firm-year is estimated as the difference between the absolute value of prediction errors for the next year's cash flows and returns before and after considering current year's earnings.

**CFO is calculated as $NPBA_{j,t+1}$-$TA_{j,t+1}$; $TA_{j,t+1}$(total accruals) = $\Delta CA_{j,t+1} - \Delta CL_{j,t+1} - \Delta CASH_{j,t+1} + \Delta STDEBT_{j,t+1} - DEPN_{j,t+1}$; $\Delta CA_{j,t+1}$= $firm_j$'s change in current assets from $year_t$ to $year_{t+1}$; $\Delta CL_{j,t+1}$= $firm_j$'s change in current liabilities from $year_t$ to $year_{t+1}$; $\Delta CASH_{j,t+1}$= $firm_j$'s change in cash from $year_t$ to $year_{t+1}$; $\Delta STDEBT_{j,t+1}$= $firm_j$'s change in short-term debt from $year_t$ to $year_{t+1}$; $DEPN_{j,t+1}$= $firm_j$'s depreciation and amortization expense in $year_{t+1}$.

4.3.4 Research Models

4.3.4.1 Value-Relevance Model

To investigate the influence of earnings quality on value-relevance of accounting information requires a valuation model that links earnings and book value information to market value. This study uses Ohlson's valuation model (Ohlson, 1995) which has been applied broadly in the value-relevance literature (e.g. Collins et al., 1997; Burgstahler and Dichev, 1997; Barth et al., 1998; Collins et al., 1999; Ou and Sepe, 2002; Whelan and McNamara, 2004). In his model, firm value is represented by stock price which is dependent on book value of equity and earnings.

$$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t}, \qquad \textit{(Model 1)}$$

where $P_{i,t}$ is stock price for $firm_i$ at the end of the fourth month after fiscal $year_t$ scaled by beginning of period price for $firm_i$, $EPS_{i,t}$ is earnings per share before extraordinary items for $firm_i$ in $year_t$ scaled by beginning of period price for $firm_i$, $BV_{i,t}$ is book value of equity for $firm_i$ at the end of $year_t$ divided by number of shares outstanding scaled by beginning of period price for $firm_i$.

The value-relevance of earnings and book value are represented by the coefficients on EPS and BV (a_1 and a_2) respectively. It is anticipated that both earnings and book value positively associated with stock price.

4.3.4.2 Value-Relevance and Earnings Quality Model

The value-relevance and earnings quality model captures the indicator variables of earnings quality through the inclusion of slop dummies interacting

with earnings and book value of equity. Each dummy variable takes a value of 1 if a firm-year observation is placed in the relevant portfolio, as defined in Section 3, and 0 otherwise. The dummy variables assist in assessing the impact of earnings quality on the value-relevance of earnings and book value. As the value-relevance of them may be influenced by the quality of earnings, the coefficients for earnings and book value are a function of earnings quality as represented by the dummy variables. In addition, intercept dummy variables are included, for the HH and LL portfolios, in the model to measure the value-relevance of earnings relevance and reliability in their own right.

$$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t}$$

With

$\beta_0 = a_0 + a_1 D_{HH} + a_2 D_{LL}$, $\beta_1 = a_3 + a_4 D_{HH} + a_5 D_{LL}$ and $\beta_2 = a_6 + a_7 D_{HH} + a_8 D_{LL}$,

where D_{HH} and D_{LL} are indicator variables that take on a value of 1 if a firm year observation is in portfolio of firms with high and low quality earnings respectively and 0 otherwise.

Thus,

$$P_{i,t} = (a_0 + a_1 D_{HH} + a_2 D_{LL}) + (a_3 + a_4 D_{HH} + a_5 D_{LL}) * EPS_{i,t} + (a_6 + a_7 D_{HH} + a_8 D_{LL}) * BV_{i,t} + \varepsilon_{i,t}$$

$$P_{i,t} = a_0 + a_1 D_{HH} + a_2 D_{LL} + a_3 EPS_{i,t} + a_4 (EPS_{i,t} * D_{HH}) + a_5 (EPS_{i,t} * D_{LL}) + a_6 BV_{i,t} + a_7 (BV_{i,t} * D_{HH}) + a_8 (BV_{i,t} * D_{LL}) + \varepsilon_{i,t} \quad \beta_4 (EPS_{i,t} * D_{HH}) \quad \beta_4 (EPS_{i,t} * D_{HH})$$

$$P_{i,t} = \beta_0 + \beta_1 D_{HH} + \beta_2 D_{LL} + \beta_3 EPS_{i,t} + \beta_4 BV_{i,t} + \beta_5 (EPS_{i,t} * D_{HH}) + \beta_6 (BV_{i,t} * D_{HH}) + \beta_7 (EPS_{i,t} * D_{LL}) + \beta_8 (BV_{i,t} * D_{LL}) + \varepsilon_{i,t}, \qquad \textit{(Model 2)}$$

The β_3 and β_4 slope coefficients indicate the value-relevance of earnings and book value respectively. The impact of earnings quality on the value-relevance of

earnings in portfolios of firms with high and low quality earnings is represented by β_5 and β_7 respectively. Likewise, the β_6 and β_8 slope coefficients represent the impact of earnings quality on the value-relevance of book value in portfolios of firms with high and low quality earnings respectively.

The market's response to earnings in portfolios of firms with high and low quality earnings will be represented by the sum of the coefficients, $\beta_3+\beta_5$ and $\beta_3+\beta_7$ respectively. Following Hypothesis 1a, it is expected that the sum of the coefficients β_3 and β_5 will be greater than the sum of the coefficients β_3 and β_7. Therefore, this hypothesis can be presented in terms of the coefficients from Equation (2) as follows:

$$H_{1a}0= \beta_3+\beta_5 = \beta_3+\beta_7$$

$$H_{1a}1= \beta_3+\beta_5 > \beta_3+\beta_7$$

The sum of the coefficients, $\beta_4+\beta_6$ and $\beta_4+\beta_8$ represent the market's response to book value of equity in portfolios of firms with high and low quality earnings respectively. Following Hypothesis 1b, it is expected that the sum of the coefficients β_4 and β_6 will be smaller than the sum of the coefficients β_4 and β_6. Therefore, this hypothesis can be presented as the regression coefficients from Equations (2) as follows:

$$H_{1b}0= \beta_4+\beta_6 = \beta_4+\beta_8$$

$$H_{1b}1= \beta_4+\beta_6 < \beta_4+\beta_8$$

To test Hypothesis 2, regarding the relative importance for relevance or reliability of earnings information, requires a valuation model that provides a link

between the value-relevance of earnings and book value with portfolios of firms with high relevance and low reliability of earnings information (HL) versus low relevance and high reliability of earnings information (LH).

$$P_{i,t} = a_{0\,i,t} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t}$$

With

$\beta_0 = a_0 + a_1 D_{HL} + a_2 D_{LH}$, $\beta_1 = a_3 + a_4 D_{HL} + a_5 D_{LH}$ and $\beta_2 = a_6 + a_7 D_{HL} + a_8 D_{LH}$,

Where D_{HL} takes value of 1 if a firm year observation is in portfolio of firms with high relevance and low reliability of earnings information; 0 otherwise, and D_{LH} is 1 if a firm year observation is in portfolio of firms with low relevance and high reliability of earnings information; 0 otherwise.

Thus

$$P_{i,t} = (a_0 + a_1 D_{HL} + a_2 D_{LH}) + (a_3 + a_4 D_{HL} + a_5 D_{LH}) * EPS_{i,t} + (a_6 + a_7 D_{HL} + a_8 D_{LH}) * BV_{i,t} + \varepsilon_{i,t}$$

$$P_{i,t} = a_0 + a_1 D_{HL} + a_2 D_{LH} + a_3 EPS_{i,t} + a_4 (EPS_{i,t} * D_{HL}) + a_5 (EPS_{i,t} * D_{LH}) + a_6 BV_{i,t} + a_7 (BV_{i,t} * D_{HL}) + a_8 (BV_{i,t} * D_{LH}) + \varepsilon_{i,t}$$

$$P_{i,t} = \beta_0 + \beta_1 D_{HL} + \beta_2 D_{LH} + \beta_3 EPS_{i,t} + \beta_4 BV_{i,t} + \beta_5 (EPS_{i,t} * D_{HL}) + \beta_6 (BV_{i,t} * D_{HL}) + \beta_7 (EPS_{i,t} * D_{LH}) + \beta_8 (BV_{i,t} * D_{LH}) + \varepsilon_{i,t} \qquad \textit{(Model 3)}$$

The β_3 slope coefficient indicates the value-relevance of earnings. The impact of each dimension of earnings quality on the value-relevance of earnings is represented by β_5 and β_7 for portfolios of firms with high relevance and low reliability of earnings information (HL) and low relevance and high reliability of earnings information (LH) respectively. The market's response to earnings for the HL and LH portfolios will be represented by the sum of the coefficients, $\beta_3+\beta_5$ and $\beta_3+\beta_7$ respectively. Similarly, the value-relevance of book value is represented by β_4. The slope coefficients of the interaction variable for book

value, β_6 and β_8, indicate the impact of each dimension of earnings quality on the value-relevance of book value in the HL and LH portfolios respectively. The sum of the coefficients, $\beta_4+\beta_6$ and $\beta_4+\beta_8$ represent the market's response to book value of equity in these two portfolios.

Following Hypotheses 2a and 2b, if market prefers one dimension of earnings quality over the other, it is expected that the sum of the coefficient for the HL portfolio will be different with the sum of the coefficient for the LH portfolio. Therefore, this hypothesis can be presented in terms of the regression coefficients from Equations (3) as follows:

$H_{2a}0= \beta_3+\beta_5 = \beta_3+\beta_7$ $\quad\quad$ $H_{2b}0= \beta_4+\beta_6 = \beta_4+\beta_8$

$H_{2a}1= \beta_3+\beta_5 \neq \beta_3+\beta_7$ $\quad\quad$ $H_{2b}1= \beta_4+\beta_6 \neq \beta_4+\beta_8$

Hypothesis 3 relates to compare the value-relevance of earnings and book value among four portfolios (HL and LH with HH and LL). The test of this hypothesis requires a valuation model that links the value-relevance of accounting information to the four portfolios of firms. This study specify the following equity valuation model to estimate the value-relevance of earnings and book value by using a slop dummy interaction with earnings and book value for each of the four portfolios (HH, LL, HL, LH):

$$P_{i,t}= \beta_0 + \beta_1 D_{HH} + \beta_2 D_{LL} + \beta_3 D_{HL} + \beta_4 D_{LH} + \beta_5 EPS_{i,t} + \beta_6 BV_{i,t} + \beta_7 (EPS_{i,t} * D_{HH}) + \beta_8 (BV_{i,t} * D_{HH}) + \beta_9 (EPS_{i,t} * D_{LL}) + \beta_{10} (BV_{i,t} * D_{LL}) + \beta_{11} (EPS_{i,t} * D_{HL}) + \beta_{12} (BV_{i,t} * D_{HL}) + \beta_{13} (EPS_{i,t} * D_{LH}) + \beta_{14} (BV_{i,t} * D_{LH}) + \varepsilon_{i,t}$$

(Model 4)

The β_5 and β_6 slope coefficients indicate the value-relevance of earnings and book value respectively. The impact of earnings quality on the value-relevance of earnings in the HH, LL, HL, and LH portfolios is represented by β_7 , β_9, β_{11} and β_{13} respectively. Likewise, the β_8, β_{10}, β_{12}, and β_{14} slop coefficients represent the impact of earnings quality on the value-relevance of book value in the HH, LL, HL, and LH portfolios respectively.

The market's response to earnings in the HH, LL, HL, and LH portfolios will be measured by the sum of the coefficients, $\beta_5 + \beta_7$, $\beta_5 + \beta_9$, $\beta_5 + \beta_{11}$, and $\beta_5 + \beta_{13}$ respectively. Following Hypothesis 3a, it is expected that the sum of the coefficient in the HH (LL) portfolios will be greater (less) than the sum of the coefficients in the HL and LH portfolios. Similarly, the market's response to book value in the HH, LL, HL, and LH portfolios will be represented by the sum of the coefficients, $\beta_6 + \beta_8$, $\beta_6 + \beta_{10}$, $\beta_6 + \beta_{12}$, and $\beta_6 + \beta_{14}$ respectively. Following Hypothesis 3b, it is expected that the sum of the coefficient in the HH (LL) portfolios will be less (greater) than the sum of the coefficients in the HL and LH portfolios. Therefore, these hypotheses can be presented in terms of the regression coefficients from Equations (4) as follows:

$H_{3a}0 = \beta_5 + \beta_7 = \beta_5 + \beta_{11}, \beta_5 + \beta_7 = \beta_5 + \beta_{13}, \beta_5 + \beta_9 = \beta_5 + \beta_{11}, \beta_5 + \beta_9 = \beta_5 + \beta_{13}$

$H_{3a}1 = \beta_5 + \beta_7 > \beta_5 + \beta_{11}, \beta_5 + \beta_7 > \beta_5 + \beta_{13}, \beta_5 + \beta_9 < \beta_5 + \beta_{11}, \beta_5 + \beta_9 < \beta_5 + \beta_{13}$

$H_{3b}0 = \beta_6 + \beta_8 = \beta_6 + \beta_{12}, \beta_6 + \beta_8 = \beta_6 + \beta_{14}, \beta_6 + \beta_{10} = \beta_6 + \beta_{12}, \beta_6 + \beta_{10} = \beta_6 + \beta_{14}$

$H_{3b}1 = \beta_6 + \beta_8 < \beta_6 + \beta_{12}, \beta_6 + \beta_8 < \beta_6 + \beta_{14}, \beta_6 + \beta_{10} > \beta_6 + \beta_{12}, \beta_6 + \beta_{10} > \beta_6 + \beta_{14}$

4.3.4.3 Control Variables

Prior studies have identified variables that influence the value-relevance of accounting measures in valuing a firm's equity. The control variables used in this study are firm size (Barth et al., 1998; Chan et al., 2006), Leverage (Barth et al., 1998; Collins et al., 1999), Firm Performance (Tobin's Q) (Penman 1998), systematic risk (Beta) (Easton and Zmijewski, 1989; Collins and Kothari, 1989), operating cycle (OPCYC) (Chan et al., 2009), growth (Collins and Kothari, 1989; Barth et al., 1999), Negative Earnings (Hayn, 1995; Collins et al., 1999). The effects of these factors on the value-relevance of accounting measures are controlled through inclusion of indicator variables in the value-relevance and earnings quality model (Equation [4]).

$$P_{i,t} = \beta_0 + \beta_1 D_{HH} + \beta_2 D_{LL} + \beta_3 D_{HL} + \beta_4 D_{LH} + \beta_5 D_{size} + \beta_6 D_{levrage} + \beta_7 D_Q + \beta_8 D_{beta} + \beta_9 D_{OPCYC} + \beta_{10} D_{growth} + \beta_{11} D_{NEPS} + \beta_{12} EPS_{i,t} + \beta_{13} BV_{i,t} + \beta_{14} (EPS_{i,t} * D_{HH}) + \beta_{15} (BV_{i,t} * D_{HH}) + \beta_{16} (EPS_{i,t} * D_{LL}) + \beta_{17} (BV_{i,t} * D_{LL}) + \beta_{18} (EPS_{i,t} * D_{HL}) + \beta_{19} (BV_{i,t} * D_{HL}) + \beta_{20} (EPS_{i,t} * D_{LH}) + \beta_{21} (BV_{i,t} * D_{LH}) + \beta_{22} (EPS_{i,t} * D_{size}) + \beta_{23} (BV_{i,t} * D_{size}) + \beta_{24} (EPS_{i,t} * D_{levrage}) + \beta_{25} (BV_{i,t} * D_{levrage}) + \beta_{26} (EPS_{i,t} * D_Q) + \beta_{27} (BV_{i,t} * D_Q) + \beta_{28} (EPS_{i,t} * D_{beta}) + \beta_{29} (BV_{i,t} * D_{beta}) + \beta_{30} (EPS_{i,t} * D_{OPCYC}) + \beta_{31} (BV_{i,t} * D_{OPCYC}) + \beta_{32} (EPS_{i,t} * D_{growth}) + \beta_{33} (BV_{i,t} * D_{growth}) + \beta_{34} (EPS_{i,t} * D_{NEPS}) + \beta_{35} (BV_{i,t} * D_{NEPS}) + \varepsilon_{i,t}, \quad \textit{(Model 5)}$$

where D_{size}, $D_{levrage}$, D_Q, D_{beta}, D_{OPCYC}, D_{growth}, and D_{NEPS} is an indicator variable that takes value on one if size, Leverage, Tobin's Q, beta, operating cycle, growth, and negative earnings of firm year observation is above the median value for that firm-year and zero otherwise.

The control variables are measured as follows. Firm size is natural logarithm of market value of equity. Leverage is measured as ratio of total debts to total assets. Tobin's Q is calculated as the sum of market value of equity and total debt divided by total assets. Systematic risk, beta, is calculated as covariance of stock returns and market return divided by variance of market returns. Operating cycle (OPCYC), natural logarithm of the sum of the firm's days accounts receivable and days inventory, is measured as $\frac{(INV_t+INV_{t-1})/2}{COGS/360} + \frac{(AR_t+AR_{t-1})/2}{Sales/360}$, where INV is the firm's inventory, COGS is the firm's cost of goods sold, and AR is the firm's accounts receivable. Growth, the annual growth rate in equity book value, is calculated as book value of equity for year t less book value of equity in year t-1, scaled by book value of equity in year t-1. Negative earnings, NEPS, equals one if EPS is negative and zero otherwise.

4.3.4.4 Comparing the Explanatory Power of Earnings and Book Value

To compare the explanatory power of earnings and book value requires decomposing total explanatory power into three components including the incremental explanatory power of earnings, book values, and common to both earnings and book values. This study disaggregates the combined explanatory power of earnings and book value of equity using a technique described in Theil (1971) and applied by Easton (1985), Collins et al. (1997), and Shamy and Kayed (2005) as follows:

The combined explanatory power of earnings and book value is derived from Equation (1). The decomposition of combined explanatory power requires estimating for the following additional two equations:

$$P_{i,t} = \beta_{0_{i,t}} + \beta_1 EPS_{i,t} + \varepsilon_{i,t} \quad \textit{(Model 6)}$$

$$P_{i,t} = \beta_{0_{i,t}} + \beta_2 BV_{i,t} + \varepsilon_{i,t} \quad \textit{(Model 7)}$$

The incremental explanatory power provided by earnings (Incr EPS) is measured by the difference between the combined explanatory powers derived from Equation (1) with the explanatory power derived from Equation (7). Similarly, the incremental explanatory power of book value (Incr BV) is calculated by the difference between the combined explanatory powers with the explanatory power derived from equation (6). The difference between the combined explanatory power with the sum of Incr EPS ($R_E{}^2$) and Incr BV ($R_B{}^2$) represents the explanatory power common to both earnings and book value of equity (Incr COM).

This study uses decomposition of combined explanatory power to investigate change in the value-relevance of accounting information. It regresses $R_T{}^2$ (Total), $R_E{}^2$ (Incr EPS), and $R_B{}^2$ (Incr BV) on a time to measure trends of the combined (Total) and the incremental explanatory power of earnings (EPS) and book value of equity (BV) respectively. The signs of the β_1 slope coefficient indicate trend (positive or negative) of value-relevance over time.

$$R^2 = \beta_{0_{i,t}} + \beta_1 Time_t + \varepsilon_t, \quad \textit{(Model 8)}$$

Where Time is equal 1, ..., 9, corresponding to the years 2000 – 2008.

This study examines the moderating effect of earnings quality on the incremental explanatory power of earnings and book value for prices over time. Therefore, the study investigates whether there are any significant differences across time in the two dimensions of earnings quality, relevance and reliability.

Specifically, it examines whether changes in the value-relevance of accounting information is associated with changes in the two dimensions of earnings quality, relevance and reliability. Therefore, the factor scores of earnings quality dimensions, relevance and reliability, are regressed on a time trend variable.

$$FS_{Relevant} = \beta_{0_{i,t}} + \beta_1 Time_t + \varepsilon_t , \qquad \textit{(Model 9)}$$

$$FS_{Reliable} = \beta_{0_{i,t}} + \beta_1 Time_t + \varepsilon_t , \qquad \textit{(Model 10)}$$

$FS_{Relevant}$ is factor score of relevance dimension, and $FS_{Reliable}$ is factor score of reliability dimension of earnings quality. The coefficient on Time is an indicator variable which indicates trend of each dimension of earnings quality over time.

4.4 Empirical Results

4.4.1 Descriptive Statistics

The descriptive statistics of the variables over the period of the study, 2000 to 2008, are reported in Table 4.2. The mean and median of variables are presented for the whole sample and each of the portfolios (HH, LL, HL, LH and other firms).The mean (median) for price, stock returns, earnings per share (EPS), and book value of equity in the whole sample are 1.103 (0.961), 0.391 (0.204), 0.188 (0.165), and 0.523 (0.426) respectively. The high return mean is due to high inflation in the period of study in Iran's economy. Comparison of these variables in the four portfolios indicates that the HH portfolio has highest mean of price and stock returns followed by the HL, LL, and LH portfolios respectively. The mean (median) for earnings per share (EPS) and book value of equity (BV) are respectively 0.248 (0.199) and 0.419 (0.286) for the HH portfolio compared to

0.150 (0.134) and 0.531 (0.474) for the LL portfolio. This suggests that EPS (BEV) in the HH portfolio are higher (lower) than EPS and BV in the LL portfolio.

With respect to the control variables, the HH portfolio has highest mean of firm size, Tobin's Q and growth followed by the HL, LL, and LH portfolios respectively. While, the mean of negative earnings, operating cycle and leverage in the LL portfolio are higher than the HH portfolio. This descriptive result is consistent with the conjecture that earnings quality are positively related to firm size, Tobin's Q and growth, whereas association between earnings quality with negative earnings, operating cycle and leverage is negative.

Table 4.2: Descriptive Statistics[20]

Variables	Whole Sample		HH Portfolio		LL Portfolio		HL Portfolio		LH Portfolio		Other	
	N=1224		N=151		N=159		N=108		N=128		N=678	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
PRICE	1.103	0.961	1.313	1.000	0.976	0.919	1.134	1.042	0.967	0.951	1.107	0.931
Return	0.391	0.204	0.717	0.514	0.249	0.084	0.525	0.433	0.124	0.000	0.381	0.224
EPS	0.188	0.165	0.248	0.199	0.150	0.134	0.216	0.186	0.081	0.084	0.200	0.172
BV	0.523	0.426	0.419	0.286	0.531	0.474	0.381	0.312	0.648	0.572	0.543	0.432
SIZE	12.04	11.938	12.720	12.573	11.647	11.248	12.601	12.665	11.069	11.153	12.077	11.954
LEVERAGE	0.682	0.690	0.615	0.640	0.797	0.821	0.645	0.670	0.730	0.732	0.666	0.677
Q	1.714	1.353	2.607	1.850	1.210	1.134	2.072	1.790	1.194	1.102	1.675	1.360
Beta	0.229	0.060	0.210	0.080	0.194	0.000	0.158	0.060	0.192	0.000	0.260	0.095
OPCYC	5.337	5.515	5.197	5.483	5.568	5.602	5.275	5.468	5.210	5.393	5.347	5.530
GROWTH	1.158	0.163	0.514	0.265	0.201	0.094	0.433	0.268	-0.201	0.002	1.898	0.156
NEPS	0.040	0.000	0.000	0.000	0.038	0.000	0.000	0.000	0.203	0.000	0.025	0.000
RELEV_S	0.000	-0.013	0.630	0.545	-0.710	-0.676	0.567	0.484	-0.596	-0.479	0.048	0.004
RELI_S	0.000	0.364	0.690	0.666	-1.458	-1.169	-0.743	-0.328	0.744	0.732	0.166	0.359

Notes:

HH	Portfolio of firms with high relevance and high reliability of earnings information
LL	Portfolio of firms with low relevance and low reliability of earnings information
HL	Portfolio of firms with high relevance and low reliability of earnings information
LH	Portfolio of firms with low relevance and high reliability of earnings information
PRICE	Stock price for $firm_i$ at the end of the fourth month after fiscal $year_t$ scaled by beginning of period price for $firm_i$.
Return	The 12 month return ending four months after the ending of the financial year.
EPS	Earnings per share before extraordinary items for $firm_i$ in $year_t$ scaled by beginning of period price for $firm_i$.
BV	Book value of equity for $firm_i$ at the end of $year_t$ divided by number of shares outstanding and scaled by price in$year_{t-1}$.
SIZE	Natural logarithm of equity market value
LEVERAGE	Ratio of total debts to total assets
Q	The sum of market value of equity and total debt divided by total assets
Beta	Covariance of stock returns and market return divided by variance of market returns
OPCYC	Natural logarithm of the sum of the firm's days accounts receivable and days inventory
GROWTH	Annual growth rate in equity book value
NEPS	Equals one if EPS is negative and zero otherwise
RELEV_S	The score obtained by factor analysis of the four earnings relevance measures (predictive value, persistence, feedback value and timeliness)
RELI_S	The score obtained by factor analysis of the four earnings reliability measures (abnormal accruals, conservatism, smoothness of earnings and accruals quality)

[20]The descriptive statistics of the variables includes 1224 firm-year observations, representing 136 active listed firms over the nine-years.

4.4.2 Correlation

Table 4.3 provides Pearson correlations among the variables used to estimate equations. Panel A presents the correlation between the scores of relevance and reliability of earnings, stock price, earnings per share, book value per share and control variables. The correlation between the scores of earnings relevance and reliability is positive and significant. In addition, there is significant and positive correlation between relevance scores with price and earnings per share, whereas the correlation between relevance scores with book value is negative and significant. However, the correlation between reliability scores of earnings and book value is positive and significant. These findings indicate different effects of relevance and reliability of earnings on the value-relevance of earnings and book value of equity.

With regard to the control variables and scores of earnings quality dimensions, there is significant and positive correlation between relevance scores with size, Tobin's Q, beta, and growth whereas, the correlation between relevance scores with leverage, operating cycle and negative earnings is negative and significant. The correlation between reliability scores with size, leverage, Tobin's Q, beta and growth is negative and significant. Meanwhile, the correlation between reliability scores and negative earnings is positive and significant. The correlation coefficients indicate that firms with large size, beta, and growth have high relevance and low reliability of earnings information, whereas in firms with negative earnings reliability of earnings is higher than relevance. Moreover, high

level of leverage and operating cycle decrease both relevance and reliability of earnings information.

Among the control variables, there is significant and positive (negative) correlation between size with (leverage), Tobin's Q, beta, (operating cycle), growth and (negative earnings). This suggests that the level of leverage, operating cycle and negative earnings in large firms is less than small firms. Meanwhile, Tobin's Q, B and growth in large firms are more than small firms. Moreover, leverage is positively associated with operating cycle and negative earnings and negatively associated with Tobin's Q and growth. Tobin's Q is positively (negatively) and significantly correlated with (operating cycle), growth and (negative earnings). Beta is negatively and significantly associated with operating cycle and negative earnings. Meanwhile, operating cycle is negatively and significantly associated with growth and growth is negatively associated with negative earnings.

Panel B of Table 4.3 provides a comparison of the Pearson correlation between price with earnings and book value of equity in the four portfolios (HH, LL, HL and LH). In portfolio of firms with high quality earnings (HH), earnings per share have a higher correlation with price than does book value of equity. However, in portfolio of firms with low quality earnings (LL), this relationship is reversed. These results indicate that the quality of earnings increases the value-relevance of accounting earnings and decreases the value-relevance of book value in determining stock price which is consistent with the study proposition.

In portfolio of firms with high relevance and low reliability (HL), the correlation of earnings with price is greater than the correlation of book value with price. However, the correlation between price and earnings per share is lower in portfolio of firms with low relevance and high reliability (LH) whereas the correlation between price and book value of equity is higher. These correlations signify different effects of relevance and reliability of earnings on the value-relevance of accounting information.

A comparison of the correlation between four portfolios reveals that the highest correlation coefficients for earnings and book value of equity are in the HH and LL portfolios respectively. However, in the LH portfolio the correlations between price with earnings and book value are weaker than other portfolio, suggesting that low relevance decreases the value-relevance of both earnings and book value of equity.

With respect to correlation between variables, the correlation matrix confirms that there is no collinearity and multicollinearity problem since none of the variables correlates above ±0.80 (see Gujarati, 2003). All correlation coefficients are less than ±0.40.

Table 4.3: Correlation Coefficients among Sample Variables, (2000-2008)

Panel A: Correlation between Variables for Whole Sample

Correlation Probability	RELEV_S	RELI_S	PRICE	EPS	BV	SIZE	LEVERAGE	Q	B	CYCLE	GROWTH	NEPS
RELEV_S	1											

RELI_S	0.134	1										
	0.000	-----										
PRICE	0.125	0.034	1									
	0.000	0.228	-----									
EPS	0.225	-0.027	0.539	1								
	0.000	0.343	0.000	-----								
BV	-0.340	0.056	0.273	0.416	1							
	0.000	0.048	0.000	0.000	-----							
SIZE	0.411	-0.072	-0.116	-0.148	-0.453	1						
	0.000	0.012	0.000	0.000	0.000	-----						
LEVERAGE	-0.374	-0.207	0.013	-0.150	-0.187	-0.137	1					
	0.000	0.000	0.647	0.000	0.000	0.000	-----					
Q	0.579	0.041	0.122	-0.093	-0.773	0.510	-0.123	1				
	0.000	0.154	0.000	0.001	0.000	0.000	0.000	-----				
B	0.063	-0.061	0.023	-0.049	-0.108	0.165	-0.005	0.041	1			
	0.029	0.033	0.422	0.088	0.000	0.000	0.875	0.157	-----			
CYCLE	-0.081	-0.044	0.005	0.042	0.075	-0.159	0.091	-0.101	-0.048	1		
	0.005	0.124	0.858	0.141	0.009	0.000	0.001	0.000	0.093	-----		
GROWTH	0.282	-0.064	0.048	0.269	-0.033	0.230	-0.302	0.186	0.036	-0.052	1	
	0.000	0.025	0.093	0.000	0.251	0.000	0.000	0.000	0.207	0.069	-----	
NEPS	-0.236	0.142	-0.026	-0.340	-0.047	-0.112	0.229	-0.099	-0.063	-0.018	-0.262	1
	0.000	0.000	0.371	0.000	0.099	0.000	0.000	0.001	0.028	0.521	0.000	-----

Notes: RELEV_S equals the score obtained by factor analysis of the four earnings relevance measures (predictive value, persistence, feedback value and timeliness). RELI_S is the score obtained by factor analysis of the four earnings reliability measures (abnormal accruals, conservatism, smoothness of earnings, and accruals quality). Notes: Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$. SIZE, LEVERAGE, Q, B, CYCLE, GROWTH, and NEPS are indicator variables that take value on one if size, Leverage, Tobin's Q, beta (systematic risk), operating cycle, and growth of firm year observation are above the median value for that firm-year and zero otherwise.

Table 4.3 (continued)

Panel B: The Correlation between Stock Price, Earning per Share and Book Value per Share in the Four Portfolios (HH, LL, HL and LH)

Portfolio of firms with high relevance and high reliability (HH)				Portfolio of firms with low relevance and low reliability (LL)			
Correlation Probability	PRICE	EPS	BV	Correlation Probability	PRICE	EPS	BV
PRICE	1			PRICE	1		
EPS	0.616	1		EPS	0.396	1	
	0.000	-----			0.000	-----	
BV	0.343	0.648	1	BV	0.410	0.421	1
	0.000	0.000	-----		0.000	0.000	-----
Portfolio of firms with high relevance and low reliability (HL)				**Portfolio of firms with low relevance and high reliability (LH)**			
Correlation Probability	PRICE	EPS	BV	Correlation Probability	PRICE	EPS	BV
PRICE	1			PRICE	1		
EPS	0.574	1		EPS	0.242	1	
	0.000	-----			0.006	-----	
BV	0.329	0.725	1	BV	0.328	0.433	1
	0.001	0.000	-----		0.000	0.000	-----

Notes: Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$.

4.4.3 Main Tests and Results

4.4.3.1 Value-Relevance of Earnings and Book Value

Table 4.4 shows the results of assessing a base model (Equation (1)) provided by Ohlson (1995), which considers stock price as a function of both earnings and book value. This regression not only evaluates the value-relevance of earnings and book value but also provides a validation for the valuation framework used in this study. Value-relevance of accounting information is estimated by the coefficients of earnings and book value of equity. It is expected that firm value to be positively related to earnings per share (EPS) and book value of equity (BV).

The coefficients of EPS and BV are consistent with the expectations of the study. The positive and significant coefficients for earnings of 1.838 (t-statistic = 21.831) and book value of 0.262 (t-statistic = 7.494) signify that both earnings and book value are value-relevant in the valuation process which is consistent with prior studies (e.g., Ou and Sepe, 2002; Collins et al., 1997; Whelan and McNamara, 2004). Furthermore, the coefficient of EPS (a_1) is over seven times larger than the coefficient of BV (a_2), indicating that the value-relevance of earnings is higher than book value in valuing a firm's equity which is consistent with the findings of Safajou et al. (2005), Pourheydari et al. (2008), and Barzegari Khanagha et al. (2011).

Table 4.4: Value-Relevance of Earnings and Book Value-Whole Sample

Equation [1]: $P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t}$

Variables	Coef.	t-stat.
Intercept	0.620	28.250 ***
EPS	1.838	21.831 ***
BV	0.262	7.494 ***
Adj. R^2	0.382	
F-Stat.	6.507 ***	
D.W	1.968	
No. of observations: 1224	Cross-sections included: 136	

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$.

4.4.3.2 Earnings Quality and Value-Relevance

Panel A of Table 4.5 shows the results of estimating Equation (2) adding earnings quality dummy variables that encompass portfolios of firms with high (HH) and low (LL) quality earnings. It is expected that the coefficient estimate for ($EPS*D_{HH}$) and ($EPS*D_{LL}$) will be positive and negative respectively, $\beta_5 > 0$ and $\beta_7 < 0$, indicating the increase (decrease) in the value-relevance of earnings for the portfolio of firms with high (low) quality earnings information. Conversely, it is expected that the coefficient estimate for ($BV*D_{HH}$) and ($BV*D_{LL}$) is negative and positive respectively, $\beta_6 < 0$ and $\beta_8 > 0$, indicating lower (higher) value-relevance of book value for firms with high (low) quality earnings information.

With the inclusion of the earnings quality interaction variables for the base model (Equation 2), the estimated coefficients and related t-statistics slightly decrease for earnings (β_3= 1.682, t-statistic = 17.777) compared to 1.838 (t-statistic = 21.831) while the coefficient on book value remains unchanged (β_4= 0.265, t-statistic = 7.143). However, the coefficients remain significant, suggesting that both earnings and book value of equity are value-relevant in determining the market value of stock.

For the portfolios of firms with high quality earnings, the value-relevance of earnings is increased, as reflected in the positive coefficient of the earnings interaction variable (β_4 = 1.207, t = 4.007). This suggests that the market's reaction to earnings increases from 1.682 to 2.889 in portfolios of firms with high quality earnings. Conversely, the value-relevance of earnings in portfolio of firms with low quality earnings is negative and significant (β_6 = -0.837, t = -2.632),

indicating a decline in market response to earning from 1.682 to 0.845 in this portfolio. These findings are consistent with Hypothesis 1a, and confirm that the value-relevance of earnings increases (decrease) when a firm has high (low) quality earnings.

The coefficient of the book value interaction variable for portfolios of firms with high quality earnings is significant with a negative sign at the 10% level (coefficient of β_6= -0.290, t-statistic = -1.664). This suggests a decline in the value-relevance of book value in firms with high quality earnings. Moreover, the significant and positive coefficient (β_8 = 0.353, t = 2.683) of the book value's interaction variable confirms that the value-relevance of book value increases in portfolio of firms with low quality earnings. This is consistent with Hypothesis 1b, which confirms that the market's reaction increases to book value when a firm has low quality earnings. This finding suggests that a decline in the quality of earnings shifts market reliance from earnings to book value in determining stock price and vice versa.

The signs of the significant coefficients of the earnings and book value interaction variables for portfolios of firms with high and low quality preliminary support Hypotheses 1a and 1b. However, the test of these hypotheses requires a comparison of the estimated value-relevance coefficients for portfolios of firms with high and low quality earnings. The coefficients on the interaction dummy variables of accounting earnings and book value of equity with the indicator variables of portfolios indicate the incremental value-relevance for that portfolio. The value-relevance of earnings for each portfolio is the sum of coefficients for

accounting earnings and the incremental value-relevance for that portfolio. Therefore, $(\beta_3+\beta_5)$ and $(\beta_3+\beta_7)$ are the value-relevance of earnings for the high and low quality earnings portfolios respectively. Similarly, the value-relevance of book value for each portfolio is the sum of coefficients for book value of equity level and the incremental value-relevance for that portfolio which indicated by the coefficients of the interaction variable for book value of equity with a portfolio indicator variable. Therefore, $(\beta_4+\beta_6)$ and $(\beta_4+\beta_8)$ are the value-relevance of book value for the high and low quality earnings portfolio respectively.

This study applies a Wald test to make a more formal comparison of the estimated coefficients. The null of Hypothesis 1a and 1b states that there is no difference between the value-relevance of earnings and book value in portfolios of firms with high and low quality earnings. The results of Wald tests for Equation (2) are reported in Pane B of Table 4.5. They provide support for Hypothesis 1a, indicating that the portfolios of firms with high quality earnings have significantly higher value-relevance of earnings in comparison with the portfolios of firms with low quality earnings. This finding confirms that the quality of earnings increases the value-relevance of earnings in equity valuation which is consistent with the results obtained by Barua (2006). In addition, the Wald test result supports Hypothesis 1b, indicating that the portfolios of firms with high quality earnings have significantly lower value-relevance of book value in comparison with the portfolios of firms with low quality earnings. This finding proves that the quality of earnings decreases the value-relevance of book value in determining stock price.

To make the effect of earnings quality on value-relevance of accounting information clearer, Equation (1) are estimated separately in portfolios of firms with high and low quality earnings. The reported results in Panels C of Table 4.5 indicate that in portfolios of firms with low quality earnings, the estimated coefficients and related t-statistics decrease for earnings and increase for book value compared to portfolios of firms with high quality earnings. Specifically, earnings in portfolios of firms with high quality earnings have a coefficient estimate of 2.971 (t-statistic = 6.687), compared to 0.912 (t-statistic = 2.607) in low quality portfolios, and the coefficient for book value is 0.083 (t-statistic = 0.362) versus 0.553 (t-statistic = 2.513) in low quality earnings. Moreover, the coefficient of book value is insignificant for the HH portfolio; however, it becomes significant in the LL portfolio. This suggests that although book value of equity is value-relevant in firms with low quality earnings, it cannot provide relevant information in the valuation process of firms with high quality earnings. The results confirm that earnings quality is positively associated with the value-relevance of earnings whereas the association between earnings quality and book value is negative which is consistent with Hypotheses 1a and 1b and also with the results obtained from Equation (2). One interpretation of these results is that the market's perception of earnings quality affects the value-relevance of accounting information in equity valuation. When the quality of earnings declines, investors may place less reliance on earnings in the decision making process and focus more on book value as an alternative measure of firm value.

In addition, when comparing the adjusted R^2 between the HH and LL portfolios (Table 4.5, Panel C); the adjusted R^2 for the pooled cross-sectional and

time-series estimation specifies that earnings and book value of equity jointly explain about 41.9% of the variation in stock prices in the HH portfolio compared to 23.7% in the LL portfolio. This finding confirms that the ability of earnings and book value to explain stock price are significantly higher in firms with high quality earnings information compared to firms with low quality earnings information.

Prior studies indicate that the decline in value-relevance of earnings is offset by the increase in value-relevance of book value (Collins et al., 1997; Burgstahler and Dichev, 1997; Barth et al., 1998; Whelan and McNamara, 2004). Moreover, Collins et al. (1997) and Francis and Schipper (1999) confirm that the combined value-relevance of these measures has not declined. However, this study provides empirical evidence suggesting that the decline in the value-relevance of earnings in portfolios of firms with low quality earnings can not exactly be offset by increasing of the value-relevance of book value. It results in a decline in the ability of earnings and book value to explain stock price changes.

The results provide empirical evidence suggesting that earnings quality increases the market's reaction to accounting information. It confirms that the quality of accounting information is reflected in investors' decision making in valuing a firm's equity which is consistent with the FASB's assertion.

Table 4.5: Value-Relevance and Earnings Quality

Panel A: The Effect of High and Low Quality Earnings on the Value-Relevance of Earnings and Book Value

Equation [2]: $P_{i,t} = \beta_0 + \beta_1 D_{HH} + \beta_2 D_{LL} + \beta_3 EPS_{i,t} + \beta_4 BV_{i,t} + \beta_5 (EPS_{i,t} * D_{HH}) + \beta_6 (BV_{i,t} * D_{HH}) + \beta_7 (EPS_{i,t} * D_{LL}) + \beta_8 (BV_{i,t} * D_{LL}) + \varepsilon_{i,t}$

Variables	Coef.	t-stat.
Intercept	0.649	25.850 ***
D_{HH}	-0.103	-1.264
D_{LL}	-0.148	-1.722 *
EPS	1.682	17.777 ***
BV	0.265	7.143 ***
EPS*D_{HH}	1.207	4.007 ***
BV*D_{HH}	-0.290	-1.664 *
EPS*D_{LL}	-0.837	-2.632 ***
BV*D_{LL}	0.353	2.683 ***
Adj. R^2	0.378	
F-Stat.	6.189 ***	
D.W	1.985	
No. of observations: 1224	Cross-sections included: 136	

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: D_{HH} and D_{LL} are indicator variables that take on a value of 1 if a firm year observation is in portfolios of firms with high and low quality earnings respectively and 0 otherwise. Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$.

Table 4.5 (continued)
Panel B: Tests of Differences-Wald Tests

Comparison of value-relevance	χ^2	Pr > |t|
$VR\_EPS_{HH} > VR\_EPS_{LL}$	23.595	<0.0001
$VR\_BV_{HH} < VR\_BV_{LL}$	8.929	0.0028

Notes: VR_EPS_{HH} and VR_EPS_{LL} are value-relevance of earnings per share in portfolios of firms with high and low quality respectively. VR_BV_{HH} and VR_BV_{LL} indicate value-relevance of book value in portfolios of firms with high and low quality respectively. The value-relevance of earnings in portfolios of firms with high and low quality earnings is measured by the sum of the coefficients in Panel A, $(\beta_3+\beta_5)$ and $(\beta_3+\beta_7)$ respectively. The sum of the coefficients, $(\beta_4+\beta_6)$ and $(\beta_4+\beta_8)$ indicate the value-relevance of book value for portfolios of firms with high and low quality earnings respectively.

Panel C: High Quality versus Low Quality Earnings
Equation [1]: $P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t}$

Variables	HH Portfolio		LL Portfolio	
	Coef.	t-stat.	Coef.	t-stat.
Intercept	0.542	3.853 ***	0.546	6.117 ***
EPS	2.971	4.627 ***	0.912	2.607 ***
BV	0.083	0.370	0.553	2.513 **
Adj. R^2	0.419		0.237	
F-Stat.	11.829 ***		5.920 ***	
No. of Cross-sections	51		41	
No. of observations	151		159	

*** significant at 1%, ** significant at 5%, * significant at 10%

Notes: Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$.

4.4.3.3 Relative Importance for Relevance or Reliability

According to Barua (2006), value-relevance of earnings and book value are compared between the HL (firms with high relevance low reliability) and LH (firms with low relevance high reliability) portfolios. The study estimates Equation (3) using the earnings quality dummy variable for HL and LH portfolios.If the equity market prefer one dimension, relevance or reliability, over the other in valuing a firm's equity, significant differences are expected in the interaction coefficients and explanatory powers of earning and book value between the two portfolios. Panel A of Table 4.6 reports coefficients, t-statistics and adjusted R^2 from pooled regression.

The coefficient on the interaction variable of earnings for HL portfolio is positive and significant at the 10% level (β_5 = 0.869, t = 1.909). This indicates that the market's response to earnings increases from 2.241 to 3.11 in portfolios of firms with high relevant and low reliable earnings information (HL). The coefficient β_6, which represents the impact of low relevant and high reliable earning information on the value-relevance of earnings, is negative and significant (β_6 = -2.227, t = -11.448). The result suggests that the market's reaction to earnings declines from 2.241 to 0.014 in portfolios of firms with low relevant and high reliable earnings information (LH).

The incremental value-relevance of book value for the HL and LH portfolios is reflected in the coefficients β_6 and β_8 respectively. The coefficients on the interaction variable of book value are insignificant, (β_6 = -0.312, t = -1.409) and (β_8 = -0.059, t = 0.675) for the HL and LH portfolios respectively. This indicates

that the value-relevance of book value in the equity valuation is unaffected by neither high relevant and low reliable earning information (LH) nor low relevant and high reliable earning information (LH). However, the insignificant coefficients on the book value interaction variables lead to the rejection of Hypothesis 2b.

The test of Hypothesis 2a requires the application of a Wald test to formally assess the differential impact of the HL and LH portfolios on the value-relevance of earnings and book value of equity. To prove this hypothesis requires that the coefficient on the earnings interaction term is different between the HL and LH portfolios. The result in Panel B of Table 4.6 indicates that the Wald test of the joint restriction is significant for the coefficients on the earnings interaction term. This suggests that relevant earnings information provides significantly more relevant information in valuing a firm's equity than do reliable earnings information. It provides support for Hypothesis 2a, which states that the portfolios of firms with high relevance and low reliability earnings versus low relevance and high reliability earnings have significantly different value-relevance of earnings. This finding suggests that from investors' viewpoint the importance of relevance is more than reliability in earnings information which is consistent with the finding of Barua (2006) and the CFA's assertion (CFA21 Institute, 2007).

In order to identify more clearly the relative desirability for relevance or reliability, equation (1) is estimated separately for both the HL and LH portfolios and report results in Panels C of Table 4.6. A comparison of the results in the two

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portfolios indicates that the coefficient on earnings for the HL portfolio is 3.774 (t-statistic = 6.744) versus 0.169 (t-statistic = 0.928) for the LH portfolio. This findings suggests that value-relevance of earnings in the HL portfolio is higher than those of the LL portfolio which is consistent with Hypothesis 2a. In addition, the coefficient on earnings becomes insignificant at conventional levels in the LH portfolio, indicating that the market is more sensitive to relevance of earnings information and high reliable with low relevant earnings information cannot provide relevant information in valuing a firm's equity. Book value in portfolio of firms with high relevant and low reliable earnings (HL) has a coefficient estimate of -0.539 (t-statistic = -2.446), compared to 0.189 (t-statistic = 2.607) in portfolio of firms with high relevant and low reliable earnings (LH). Moreover, the coefficient on book value is positive for the LH portfolio; however, it becomes negative in the HL portfolio. This result is somewhat surprising as it indicates stock price, in the HL portfolio, will decrease as book value of equity increases.

A comparison of the reported results in the two portfolios also indicates that in the LH portfolio, the estimated coefficients decrease for earnings and increase for book value compared to the HL portfolio. In addition, comparing the adjusted R^2 between the HL and LH portfolios (Table 4.6, Panel C) indicates that earnings and book value of equity jointly explain 39.5% of the variation in stock prices in the HL portfolio compared to 14.5% in the LH portfolio. This confirms that explanatory powers of earnings and book value of equity to explain stock price are significantly higher in firms with high relevance and low reliability earnings information compared to firms with low relevance and high reliability earnings information. This could indicate that as the relevance of earnings information

declines, investors may place less reliance on earnings and focus on book value of equity as a proxy in the valuation process. Consequently, earnings become less value-relevant and book value becomes more value-relevant in the valuation process. However, increasing in the value-relevance of book value cannot compensate the decline in the value-relevance of accounting earnings, since book value of equity is only one of alternate sources of accounting numbers. As a result, combined explanatory powers of earnings and book value decrease in the LH portfolios.

Table 4.6: Relative Importance for Relevance or Reliability

Panel A: The Effect of HL and LH on the Value-Relevance of Earnings and Book Value- Whole Sample

Equation [3]: $P_{i,t} = \beta_0 + \beta_1 D_{HL} + \beta_2 D_{LH} + \beta_3 EPS_{i,t} + \beta_4 BV_{i,t} + \beta_5 (EPS_{i,t} * D_{HL}) + \beta_6 (BV_{i,t} * D_{HL}) + \beta_7 (EPS_{i,t} * D_{LH}) + \beta_8 (BV_{i,t} * D_{LH}) + \varepsilon_{i,t}$

Variables	Coef.	t-stat.
Intercept	0.529	22.030 ***
D_{HL}	-0.051	-0.523
D_{LH}	0.291	4.170 ***
EPS	2.241	24.902 ***
BV	0.257	7.377 ***
EPS*D_{HL}	0.869	1.909 *
BV*D_{HL}	-0.312	-1.409
EPS*D_{LH}	-2.227	-11.448 ***
BV*D_{LH}	0.059	0.675
Adj. R^2	0.456	
F-Stat.	8.156	
D.W	1.992 ***	
No. of observations: 1224	Cross-sections included: 136	

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: D_{HL} and D_{LH} are indicator variables that take on a value of 1 if a firm year observation is in portfolios of firms with high relevance low reliability and low relevance high reliability respectively and 0 otherwise. Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$.

Table 4.6 (continued)

Panel B: Tests of Differences-Wald Tests

Comparison of value-relevance	χ^2	Pr > |t|
$VR\_EPS_{HL} > VR\_EPS_{LH}$	8.160	0.0043
$VR\_BV_{HL} < VR\_BV_{LH}$	6.208	0.0127

Notes: VR_EPS_{HH} and VR_EPS_{LL} are value-relevance of earnings per share in portfolios of firms with high relevance low reliability and low relevance high reliability respectively. VR_BV_{HH} and VR_BV_{LL} indicate value-relevance of book value in portfolios of firms with high relevance low reliability and low relevance high reliability respectively. The value-relevance of earnings in portfolios of firms with high relevance low reliability and low relevance high reliability is measured by the sum of the coefficients in Panel A, $(\beta_3+\beta_5)$ and $(\beta_3+\beta_7)$ respectively. The sum of the coefficients, $(\beta_4+\beta_6)$ and $(\beta_4+\beta_8)$ indicate the value-relevance of book value for the portfolios of firms with high relevance low reliability and low relevance high reliability respectively.

Panel C: Value-Relevance of Earnings and Book value in Portfolios of Firms with High Relevance Low Reliability (HL) versus Low Relevance High Reliability (LH)

Equation [1]: $P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t}$

Variable	HL		LH	
	Coef.	t-stat.	Coef.	t-stat.
Intercept	0.525	5.500 ***	0.830	10.504 ***
EPS	3.774	6.744 ***	0.169	0.926
BV	-0.539	-2.446 **	0.189	1.672 *
Adj. R^2	0.395		0.145	
F-Stat.	7.995 ***		3.150 ***	
No. of Cross-sections	37		43	
No. of observations	108		128	

*** significant at 1%, ** significant at 5%, * significant at 10%

Notes: Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$.

4.4.3.4 Value-Relevance of Earnings and Book Value in Four Portfolios

Hypothesis 3a relates to compare the value-relevance of earnings among four portfolios (HL and LH with HH and LL). It states that the portfolios of firms with high (low) quality earnings have significantly higher (lower) value-relevance of earnings in comparison with the portfolios of firms with high relevance & low reliability earnings (HL) and low relevance & high reliability earnings (LH). This hypothesis is tested by using a slope dummy interaction with earnings and book value for each of the four portfolios (HH, LL, HL, and LH) as shown in equation (4). Following proposition, it is expected that the coefficient on the earnings interaction variables for both the HL (β_{11}) and LH portfolios (β_{13}) to be more (less) than the coefficient on the earnings interaction variables for the LL (HH) portfolios (β_9 and β_8 respectively).

Table 4.7 shows the results of estimating Equation (4). The significant coefficients of the earnings interaction variables for the HH, LL, HL and LH portfolios are 0.705 (t = 2.449), -1.345 (t = -4.077), 0.917 (t = 2.001), and -2.212 (t = -11.107) respectively. This suggest that the value-relevance of earnings in firms with high quality earnings (HH) and high relevant and low reliable earnings (HL) increase from 2.193 to 2.898 and 3.11 respectively, which are consistent with the results reported on Tables 4.5 and 4.6. The results also indicate the decline in the value-relevance of earnings from 2.193 to 0.848 in LL portfolio and 0.019 in LH portfolio. These findings suggest that firms in the HL portfolio have the largest value-relevance of earnings, while firms in the low relevance and high

reliability (LH) portfolios have the smallest value-relevance of earnings in determining stock price, which is inconsistent with Hypothesis 3a. Thus, the value-relevance (VREPS) of these four portfolios specify a pattern where $VREPS_{HL} > VREPS_{HH} > VREPS_{LL} > VREPS_{LH}$.

The Hypothesis 3b relates to compares the value-relevance of book value in four portfolios. It is expected that the coefficient on the book value interaction variables for both the HL (β_{12}) and LH portfolios (β_{14}) to be more (less) than the coefficient on the book value interaction variables for the HH (LL) portfolios (β_8 and β_{10} respectively).

According to the reported results in Table 4.7, the coefficient on the interaction variables for book value in the HH, LL, HL and LH portfolios are -0.279 (t = -1.648), 0.355 (t = 2.664), -0.341 (t = 1.545) and 0.052 (0.593) respectively. The significant coefficients on the book value interaction variables in HH and LL portfolios are negative and positive respectively, indicating low value-relevance of book value information in portfolio of firms with high quality earnings (HH) and low value-relevance of book value information in portfolio of firms with low quality earnings (LL). However, the coefficients on the book value interaction variables in the HL and LH portfolios are not significant, suggesting that the value-relevance of book value (VRBV) is unaffected by neither high relevant and low reliable nor low relevant and high reliable earnings.

The results imply a pattern that $VRBV_{LL} > VRBV_{LH} > VRBV_{HH} > VRBV_{HL}$ which are consistent with the results reported in Tables 4.5 and 4.6, but inconsistent with Hypothesis 3b. These findings suggest that firms with low

quality earnings have the largest value-relevance of book value (consistent with Hypothesis 3b) and firms with high relevant and low reliable earnings have the smallest value-relevance of book value in valuing a firm's equity (inconsistent with Hypothesis 3b).

Most importantly, the value-relevance of earnings (book value) in the HH portfolio is explicitly and significantly higher (lower) than the LL portfolio. This confirm that earnings quality increases (decreases) the value-relevance of accounting earnings (book value of equity) which are consistent with the inferences drawn from comparing the explanatory power of earnings and book value. These results are due to more reliance of investors on earnings in the HH portfolios. While, when the quality of earnings declines, investors will shift their reliance from earnings to book value in equity valuation. This suggests that earnings quality moderates the value-relevance of earnings and book value. These findings not only confirm the Hypotheses H1a and H1b but also validate the earnings quality construct applied in this study.

Table 4.7: Comparison of the Value-Relevance of Earnings and Book Value in Four Portfolios- Whole Sample

Equation [4]: $P_{i,t} = \beta_0 + \beta_1 D_{HH} + \beta_2 D_{LL} + \beta_3 D_{HL} + \beta_4 D_{LH} + \beta_5 EPS_{i,t} + \beta_6 (EPS_{i,t} * D_{HH}) + \beta_7 (EPS_{i,t} * D_{LL}) \quad \beta_8 (EPS_{i,t} * D_{HL}) + \beta_9 (EPS_{i,t} * D_{LH}) + \beta_{10} BV_{i,t} + \beta_{11} (BV_{i,t} * D_{HH}) + \beta_{12} (BV_{i,t} * D_{LL}) + \beta_{13} (BV_{i,t} * D_{HL}) + \beta_{14} (BV_{i,t} * D_{LH}) + \varepsilon_{i,t}$

Variables	Coef.	t-stat.
Intercept	0.535	19.152 ***
D_{HH}	-0.002	-0.021
D_{LL}	-0.059	-0.675
D_{HL}	-0.047	-0.486
D_{LH}	0.295	4.151 ***
EPS	2.193	21.101 ***
BV	0.266	7.171 ***
EPS*D_{HH}	0.705	2.449 **
BV*D_{HH}	-0.279	-1.648 *
EPS*D_{LL}	-1.345	-4.077 ***
BV*D_{LL}	0.355	2.664 ***
EPS*D_{HL}	0.917	2.001 **
BV*D_{HL}	-0.341	-1.545
EPS*D_{LH}	-2.212	-11.107 ***
BV*D_{LH}	0.052	0.593
Adj. R2	0.454	
F-Stat.	7.837 ***	
D.W	2.006	
No. of observations: 1224		Cross-sections included: 136

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: D_{HH} and D_{LL} are indicator variables that take on a value of 1 if a firm year observation is in portfolios of firms with high and low quality earnings respectively and 0 otherwise. D_{HL} and D_{LH} are indicator variables that take on a value of 1 if a firm year observation is in portfolios of firms with high relevance low reliability and low relevance high reliability respectively and 0 otherwise. Price is stock price at the end of the fourth month after fiscal year$_t$ scaled by price in year$_{t-1}$. EPS is earnings per share before extraordinary items at the end of year$_t$ scaled by price in year$_{t-1}$. BV is book value of equity at the end of year$_t$ divided by number of shares outstanding and scaled by price in year$_{t-1}$.

4.4.3.5 Control Variables

Table 4.8 shows the results of testing hypotheses after controlling variables which are known as effective factors on the relative value-relevance of earnings and book value of equity. These variables are size, leverage, Tobin's Q, systematic risk (beta), operating cycle (OPCYC), growth, and negative earnings (NEPS).

With the inclusion of the control interaction variables for the earnings quality and value-relevance model (Equation 4), the estimated coefficients and related t-statistics decrease for earnings (β_{12} = 1.164, t = 5.785) compared to 2.193 (t-statistic = 21.101) while the coefficient on book value increases (β_{13} = 0.351, t = 4.846) compared to 0.266 (t-statistic = 7.171). However, the coefficients remain significant, indicating the both earnings and book value of equity are value-relevant in the valuation process. This confirms that control variables are associated with the shift in value-relevance from earnings to book values.

Although, the coefficient on the earnings for the HH portfolio is insignificant (β_{14} = 0.128, t = 0.470), the coefficient on the earnings for the LL portfolio is negative and significant (β_{16} = -1.320, t = -4.999). Moreover, the coefficient on the book value for the HH portfolio is negative and significant (β_{15} = -0.344, t = -2.232), whereas for the LL portfolio is positive and significant (β_{17} = 0.266, t = 2.369). This findings provide evidence that the quality of earnings is positively (negatively) associated with the value-relevance of earnings (book value). The results specify that the inclusion of the control variables do not change the inferences drawn from Equation (4). However, in the Equation (4) the coefficients

on the earnings for the HL and LH portfolios are significant; they becomes insignificant at conventional levels when the control variables are included (t = 0.893 and -1.570 respectively).

Table 4.8 also presents further evidence of the effect of control variables on the value-relevance of earnings and book values. The coefficient of the size interaction variables for earnings is positive and significant, (β_{22} = 0.397, t = 2.392), which confirms that the value-relevance of earnings increases with firm size. Although the coefficient of the size interaction variable for book value is insignificant, the coefficient is negative and has the expected sign. These findings suggest that firm size is related with variation in the value-relevance of earnings and book values. It also indicates that value-relevance shifts from earnings to book values in valuing smaller companies. The result is consistent with those obtained by Hayn (1995), and Collins et al. (1997).

The coefficient of the leverage interaction variables for earnings is positive and significant (t = 2.123), indicating that firms with high debt ratio have the high value-relevance of earnings in determining stock price. This is inconsistent with those obtained by Biddle and Seow (1991), who find that the ERC is negatively related to leverage. However, the coefficient for book value is negative and insignificant (t = -0.726).

The coefficients of the Tobin's Q interaction variables for earnings and book value of equity are positive and significant (β_{26}= 0.868, t = 4.592 and β_{27} = 0.272, t = 2.038 respectively). This finding suggests that performance of firms, as measured by Tobin's Q, is positively associated with the value-relevance of

earnings and book value in valuing a firm's equity. According to Conqvist and Nilsson (2003) a high Tobin's Q value suggests that the market expects the firm to have valuable intangibles and good growth perspectives. Moreover, the coefficient of the Tobin's Q interaction variables for earnings is over third larger than the coefficient of book value which indicates a greater impact of Tobin's Q on the value-relevance of earnings than of book value.

The coefficient of beta interaction variables for earnings, β_{28}= 0.752, t = 5.056, is positive and significant. This result is somewhat surprising as it indicates the value-relevance of earnings will increase as a firm's systematic risk increases. However, the coefficient for book value is negative and insignificant (β_{29}= -0.020, t = -0.322).

The coefficient of the operating cycle (OPCYC) interaction variables for earnings, β_{30}= -0.363, t = -2.351, is negative and significant. While, the coefficient for book value interaction variable is significant with positive sign (β_{31}= 0.121, t = 1.851). It clarifies that in firms with high operating cycle, value-relevance of accounting information shifts from earnings to book value in equity valuating.

As predicted, the coefficients of the growth interaction variables for earnings and book value are positive and significant (β_{32}= 0.389, t = 2.690 for earnings and β_{33}= 0.286, t = 4.600 for book value). This indicates that growth of firms increases the overall ability of earnings and book values to explain stock price.

The coefficients of the negative earnings interaction variables for earnings (β_{34}= -1.602, t = -4.295) and book value (β_{35}= -0.436, t = -3.282) are negative and significant. It suggests that firms with negative earnings have a decline in the value-relevance of both earnings and book value in equity valuation. The result in relation to value-relevance of earnings is consistent with those obtained by Hayn (1995), Elliott and Hanna (1996), Collins et al. (1997), Basu (1997), and Marquardt et al. (2004), who find that firms reporting negative earnings have smaller value-relevance of earnings than firms reporting positive earnings. In addition, studies by Hayn (1995), Elliott and Hanna (1996), and Basu (1997) suggest that negative earnings and nonrecurring items can adversely affect the value-relevance of earnings. However, result in relation to value-relevance of book value is inconsistent with who found that the value-relevance of book values increases when earnings contain nonrecurring items or are negative (Jan and Ou, 1995; Berger et al., 1996; Barth et al., 1997; Burgstahler and Dichev, 1997; Collins et al., 1997).

Overall, the results in Table 4.8 demonstrate that after the inclusion of the control interaction variables in Equation (4), the results consistently confirm that the quality of accounting information reflects in investors' decision making in equity valuing which is consistent with the FASB's assertion. Moreover, the results indicate that firm size, leverage, Tobin's Q, systematic risk (beta), operating cycle (OPCYC), growth, and negative earnings (NEPS) are all associated with variation in the value-relevance of earnings and book values. In addition, earnings quality, firm size and operating cycle (OPCYC) may explain the shift in value-relevance from earnings to book values.

Table 4.8: Value-Relevance and Earnings Quality Model: Impact of Control Variables

Equation [5]: $P_{i,t} = \beta_0 + \beta_1 D_{HH} + \beta_2 D_{LL} + \beta_3 D_{HL} + \beta_4 D_{LH} + \beta_5 D_{size} + \beta_6 D_{levrage} + \beta_7 D_Q + \beta_8 D_{beta} + \beta_9 D_{OPCYC} + \beta_{10} D_{growth} + \beta_{11} D_{NEPS} + \beta_{12} EPS_{i,t} + \beta_{13} BV_{i,t} + \beta_{14} (EPS_{i,t} * D_{HH}) + \beta_{15} (BV_{i,t} * D_{HH}) + \beta_{16} (EPS_{i,t} * D_{LL}) + \beta_{17} (BV_{i,t} * D_{LL}) + \beta_{18} (EPS_{i,t} * D_{HL}) + \beta_{19} (BV_{i,t} * D_{HL}) + \beta_{20} (EPS_{i,t} * D_{LH}) + \beta_{21} (BV_{i,t} * D_{LH}) + \beta_{22} (EPS_{i,t} * D_{size}) + \beta_{23} (BV_{i,t} * D_{size}) + \beta_{24} (EPS_{i,t} * D_{levrage}) + \beta_{25} (BV_{i,t} * D_{levrage}) + \beta_{26} (EPS_{i,t} * D_Q) + \beta_{27} (BV_{i,t} * D_Q) + \beta_{28} (EPS_{i,t} * D_{beta}) + \beta_{29} (BV_{i,t} * D_{beta}) + \beta_{30} (EPS_{i,t} * D_{OPCYC}) + \beta_{31} (BV_{i,t} * D_{OPCYC}) + \beta_{32} (EPS_{i,t} * D_{growth}) + \beta_{33} (BV_{i,t} * D_{growth}) + \beta_{34} (EPS_{i,t} * D_{NEPS}) + \beta_{35} (BV_{i,t} * D_{NEPS}) + \varepsilon_{i,t}$

Variables	Coef.	t-stat.
Intercept	0.484	8.240 ***
D_{HH}	0.116	1.597
D_{LL}	0.021	0.269
D_{HL}	0.058	0.636
D_{LH}	0.132	1.810 *
D_{size}	-0.110	-2.310 **
$D_{levrage}$	0.075	1.551
D_Q	0.002	0.042
D_{beta}	-0.014	-0.354
D_{OPCYC}	-0.041	-0.907
D_{growth}	-0.194	-4.484 ***
D_{NEPS}	0.537	4.454 ***
EPS	1.164	5.785 ***
BV	0.351	4.846 ***
EPS*D_{HH}	0.128	0.470
BV*D_{HH}	-0.344	-2.232 **
EPS*D_{LL}	-1.320	-4.999 ***
BV*D_{LL}	0.266	2.369 **
EPS*D_{HL}	0.395	0.893
BV*D_{HL}	-0.177	-0.872
EPS*D_{LH}	-0.375	-1.570
BV*D_{LH}	-0.077	-0.771
EPS*D_{size}	0.397	2.392 **
BV*D_{size}	-0.108	-1.536
EPS*$D_{levrage}$	0.352	2.123 **
BV*$D_{levrage}$	-0.048	-0.726
EPS*D_Q	0.868	4.592 ***

Table 4.8 (continued)

BV*D_Q	0.272	2.038 **
EPS*D_{beta}	0.752	5.056 ***
BV*D_{beta}	-0.020	-0.322
EPS*D_{OPCYC}	-0.363	-2.351 ***
BV*D_{OPCYC}	0.121	1.851 *
EPS*D_{growth}	0.389	2.690 ***
BV*D_{growth}	0.286	4.600 ***
EPS*D_{NEPS}	-1.602	-4.295 ***
BV*D_{NEPS}	-0.436	-3.282 ***
Adj. R^2	0.592	
F-Stat.	11.448	
D.W	2.008	
No. of observations: 1224		Cross-sections

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: D_{HH} and $D_{LL}$are indicator variables that take on a value of 1 if a firm year observation is in portfolios of firms with high and low quality earnings respectively and 0 otherwise. D_{HL} and $D_{LH}$are indicator variables that take on a value of 1 if a firm year observation is in portfolios of firms with high relevance low reliability and low relevance high reliability respectively and 0 otherwise. Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$. D_{size}, $D_{levrage}$, D_Q, D_{beta}, D_{OPCYC}, D_{growth}, and D_{NEPS} are indicator variables that take value on one if size, Leverage, Tobin's Q, beta (systematic risk), operating cycle, and growth of firm year observation are above the median value for that firm-year and zero otherwise.

4.4.3.6 Robustness Analysis

Another value-relevance measure of accounting information is its power to explain changes in market price of stock. To test the robustness of the results, the study also assess the incremental contribution of each attribute in explaining stock price with the use of the base model (Equation 1) and estimating Equations (6 and 7).

In Panels A, B, C, and D of Table 4.9 price is regressed on: (1) both earnings and book values; (2) earnings; and (3) book values of equity for the HH, LL, HL and LH portfolios respectively. The incremental explanatory power of earnings (Incr EPS) is the explanatory power, R^2, from regression (1) less the R^2 from regression (3). The incremental explanatory power of book value (Incr BV) is the R^2 from regression (1) less the R^2 from regression (2). The explanatory power common to both EPS and BV (Incr COM) is the remaining explanatory power.

Panel E of Table 4.9, reports the incremental explanatory power of earnings, book value and common to both earnings and book value of equity. For portfolio of firms with high quality earnings (HH), earnings have an incremental explanatory power over five times larger than those with low quality earnings (LL), 18% and 3.2%, respectively, While portfolio of firms with low quality earnings have extremely higher incremental R^2s from book value compared to portfolio of firms with high quality earnings (8.4% vs. -0.4%). Panel E also shows that firms with high relevance and low reliability (HL) have extremely higher incremental R^2s from earnings compared to firms with Low relevance and high

reliability (LH) (0.27 vs. -0.001), and have slightly higher incremental R^2s from book values (0.031 vs. 0.013).

These results are interpreted as broadly supporting the main Hypotheses (1a, 1b, 2a and 2b) and inferences that the study drew from considering the estimated coefficient of the HH, LL, HL and LH portfolios interaction variables for earnings and book value, in the estimating Equations (2,3 and 4).

Furthermore, the explanatory power of earnings (EXP_EPS) in four portfolios specify a pattern where $EXP\_EPS_{HL} > EXP\_EPS_{HH} > EXP\_EPS_{LL} > EXP\_EPS_{LH}$ which are consistent with the results reported in section 5.3. The results also imply a pattern for the explanatory power of book value (EXP_BVE) that $EXP\_BV_{LL} > EXP\_BV_{HL} > EXP\_BV_{LH} > EXP\_BV_{HH}$ which are inconsistent with the results reported in section 5.3. However, these findings provide support for Hypothesis 3b which states the portfolios of firms with high (low) quality earnings have significantly lower (higher) value-relevance of book value in comparison with the portfolios of firms with high relevance & low reliability earnings (HL) and low relevance & high reliability earnings (LH).

Table 4.9: Comparing the Explanatory Power of Earnings and Book Value

The Equations:

$$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + \varepsilon_{i,t} \quad (6)$$

$$P_{i,t} = a_{0_{i,t}} + a_2 BV_{i,t} + \varepsilon_{i,t} \quad (7)$$

Pane A: Regressions of Price on Earnings and Book Value for Portfolio of Firms with High Quality Earnings (HH)

Variables	$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t}$		$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + \varepsilon_{i,t}$		$P_{i,t} = a_{0_{i,t}} + a_2 BV_{i,t} + \varepsilon_{i,t}$	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Intercept	0.542	4.995 ***	0.552	5.281 ***	0.883	8.058 ***
EPS	2.971	6.687 ***	3.070	8.807 ***		
BV	0.083	0.362			1.027	4.982 ***
Adj. R^2	0.419		0.423		0.239	
F-Stat.	11.829 ***		13.211 ***		6.241 ***	
No. of observations: 151			Cross-sections included: 51			

*** significant at 1%, ** significant at 5%, * significant at 10%

Notes: Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$.

Table 4.9 (continued)

Panel B: Regressions of Price on Earnings and Book Value for Portfolio of Firms with Low Quality Earnings (LL)

Variables	$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t}$		$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + \varepsilon_{i,t}$		$P_{i,t} = a_{0_{i,t}} + a_2 BV_{i,t} + \varepsilon_{i,t}$	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Intercept	0.546	6.117 ***	0.758	12.452 ***	0.608	8.116 ***
EPS	0.912	2.607 ***	1.458	4.448 ***		
BV	0.553	2.513 **			0.692	5.540 ***
Adj. R^2	0.237		0.154		0.205	
F-Stat.	5.920 ***		4.192 ***		5.533 ***	
No. of observations: 159			Cross-sections included: 41			

*** significant at 1%, ** significant at 5%, * significant at 10%

Notes: Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$.

Table 4.9 (continued)

Panel C: Regressions of Price on Earnings and Book Value for Portfolio of Firms with High Relevance and Low Reliability (HL)

Variables	$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t}$		$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + \varepsilon_{i,t}$		$P_{i,t} = a_{0_{i,t}} + a_2 BV_{i,t} + \varepsilon_{i,t}$	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Intercept	0.525	5.500 ***	0.526	5.370 ***	0.944	10.801 ***
EPS	3.774	6.744 ***	2.819	6.855 ***		
BV	-0.539	-2.446			0.496	2.608 ***
Adj. R^2	0.395		0.365		0.121	
F-Stat.	7.995 ***		7.821 ***		2.635 ***	
D.W	1.569		1.525		1.740	
No. of observations: 108				Cross-sections included: 37		

*** significant at 1%, ** significant at 5%, * significant at 10%

Notes: Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$.

Table 4.9 (continued)

Panel D: Regressions of Price on Earnings and Book Value for Portfolio of Firms with High Reliability and Low Relevance (LH)

Variables	$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + a_2 BV_{i,t} + \varepsilon_{i,t}$		$P_{i,t} = a_{0_{i,t}} + a_1 EPS_{i,t} + \varepsilon_{i,t}$		$P_{i,t} = a_{0_{i,t}} + a_2 BV_{i,t} + \varepsilon_{i,t}$	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Intercept	0.830	10.504 ***	0.942	22.122 ***	0.814	10.561 ***
EPS	0.169	0.926	0.302	1.827 *		
BV	0.189	1.672 *			0.235	2.310 **
Adj. R^2	0.145		0.132		0.146	
F-Stat.	3.150 ***		3.142 ***		3.409 ***	
No. of observations: 128				Cross-sections included: 43		

*** significant at 1%, ** significant at 5%, * significant at 10%

Notes: Price is stock price at the end of the fourth month after fiscal $year_t$ scaled by price in $year_{t-1}$. EPS is earnings per share before extraordinary items at the end of $year_t$ scaled by price in $year_{t-1}$. BV is book value of equity at the end of $year_t$ divided by number of shares outstanding and scaled by price in $year_{t-1}$.

Panel E: Incremental Explanatory Power of Earnings (EPS), Book Value (BE) and Common (Com) to both Earnings and Book Value of Equity

Incremental Explanatory Power	HH Portfolio	LL Portfolio	HL Portfolio	LH Portfolio
Incr EPS	0.180	0.032	0.274	-0.001
Incr BV	-0.004	0.084	0.031	0.013
Incr Com	0.243	0.122	0.090	0.133

Notes: Incr EPS and Incr BV are the incremental explanatory power of earnings and book value respectively. The explanatory power common to both EPS and BV (Incr COM) is the remaining explanatory power.

4.4.3.7 Variation of the Value-Relevance of Earnings and Book Value of Equity and Earnings Quality over Time

This study also investigates variation of the value-relevance of accounting information and earnings quality over the sample period. Therefore, it regresses the R-squared values, (1) the R^2 from the yearly regressions of price on earnings and book values, (2) the incremental R^2 of book value, and (3) the incremental R^2 of earnings, on a time-trend variable as shown in equation (8).

Panel A of Table 4.10 shows the results of estimating equation (8) for the regression of $R_T{}^2$ (Total), $R_E{}^2$ (Incr EPS), and $R_B{}^2$ (Incr BV) on a time trend variable. The significant and negative coefficient on the TIME variable in regressions of total R^2 (t = -2.421) reveals that there is a significant decrease in the combined value-relevance of earnings and book value over the sample period. In the regression of the Incremental R^2 of earnings, the coefficient of time is consistently negative and significant at the 10% level (t = 2.304). However, the insignificant coefficient on the TIME variable in the regression of the Incremental R^2 of book value, (t = -0.434) suggests that there is not a significant change in the incremental value-relevance of book value over time.

This study investigates whether there are any significant differences across time in the two dimensions of earnings quality, relevance and reliability. Specifically, it examines whether changes in the incremental explanatory power of earnings and book value for prices is associated with changes in the quality of earnings over time. Therefore, factor scores of earnings quality dimensions, relevance and reliability, are regressed on a time trend variable. The results in

Panel B of Table 4.10 show that the coefficient on Time is negative and significant (t=-3.603) for the regression of relevance scores. This finding signifies that relevance of earnings information declines over time. However, in the regression of the scores for reliability dimension of earnings quality, the coefficient on Time is insignificant (t= 0.187), indicating that the reliability of earnings information is unchanged over time.

These results confirm that a decline in value-relevance of earnings over time can be explained by the decreasing significance of relevance-based earnings quality attributes.

Table 4.10: Variation of the Value-Relevance of Earnings and Book value of Equity and Earnings Quality over Time

Panel A: Regressions of total R^2, Incremental Book ValueR^2, and Incremental Earnings R^2 on Time-Trend Variable

$$R_T{}^2 = \beta_{0i,t} + \beta_1 Time_t + \varepsilon_t, \quad R_E{}^2 = \beta_{0i,t} + \beta_1 Time_t + \varepsilon_t \text{ and } \quad R_B{}^2 = \beta_{0i,t} + \beta_1 Time_t + \varepsilon_t,$$

Variables	Dependent variable					
	Total ($R_T{}^2$)		Incremental earnings ($R_E{}^2$)		Incremental book value ($R_B{}^2$)	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Intercept	0.431	5.035 ***	0.299	4.694 ***	0.016	1.457
Time	-0.041	-2.421 *	-0.029	-2.304 *	-0.001	-0.434
Adj. R^2	0.410		0.381		-0.131	
F-Stat.	5.864		5.307		0.188	

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: Total $R_T{}^2$ is total explanatory power of earnings and book value. $R_E{}^2$ is explanatory power of earnings. $R_B{}^2$ is explanatory power of book value. TIME is 1 for year 2000, and increases by one for each additional year.

Table 4.10 (continued)

Panel B: Regressions of Factor Scores of Earnings Quality Dimensions, Relevance and Reliability, on a Time Trend Variable

$$FS_{Relevant} = \beta_{0_{i,t}} + \beta_1 Time_t + \varepsilon_t, \qquad (9)$$

$$FS_{Reliable} = \beta_{0_{i,t}} + \beta_1 Time_t + \varepsilon_t, \qquad (10)$$

	$FS_{Relevant} = \beta_{0_{i,t}} + \beta_1 Time_t + \varepsilon_t$,		$FS_{Reliable} = \beta_{0_{i,t}} + \beta_1 Time_t + \varepsilon_t$,	
	Coef.	t-stat.	Coef.	t-stat.
Intercept	0.076	3.700 ***	-0.037	-0.290
Time	-0.015	-3.603 ***	0.005	0.187
Adj. R^2	0.631		-0.160	
F-Stat.	12.982		0.035	

***significant at 1%, ** significant at 5%, * significant at 10%

Notes: $FS_{Relevant}$ is factor score of relevance dimension, and $FS_{Reliable}$ is factor score of reliability dimension of earnings quality. TIME is 1 for year 2000, and increases by one for each additional year.

4.5 Conclusions

This study has linked earnings quality with equity valuation by assessing its effect on the value-relevance of accounting information. In this respect, this paper examined whether the qualitative characteristics of accounting earnings influence the value-relevance of accounting items. It focused on earnings quality in evaluating the relative desirability between the value-relevance of earnings and book value. Moreover, the study compared the incremental explanatory power of earnings and book values and examined the relative preference between relevance and reliability of earnings information in the equity valuation process.

The results of study indicate that first, both earnings and book value are value-relevant in the valuation process which is consistent with prior studies (e.g. Collins et al., 1997; Ou and Sepe, 2002; Whelan and McNamara, 2004). It also specifies that value-relevance of earnings is higher than book value in valuing firm's equity which is consistent with those obtained by Safajou et al. (2005), Pourheydari et al. (2008), and Barzegari Khanagha et al. (2011). Second, the valuation models in firms with high and low quality earnings have an explanatory power of 41.9% and 23.7% respectively. The increment of explanatory power in firms with high quality earnings (HH) not only confirms that earnings quality information is relevant in valuing a firm's equity but also validates the earnings quality construct applied in this study. Third, most importantly, the value-relevance of earnings (book value) in the HH portfolio is explicitly and significantly higher (lower) than the LL portfolio. This finding suggests that earnings quality moderates the value-relevance of earnings and book value. It

causes an increase in the market's focus on earnings as the basis for valuation purposes, which is reflected in an increase in the value-relevance of earnings and a decrease in the value-relevance of book value. Moreover, lack of earnings quality shifts the market's reliance from earnings to book value in equity valuation, which is reflected in an increase in the value-relevance of book value and a decrease in the value-relevance of earnings. Fourth, investigation of relative preference between relevance and reliability shows that the ability of earnings to explain market price and the coefficient of the earnings' interaction variable are significantly higher in firms with high relevance and low reliability (HL) compared to firms with low relevance and high reliability (LH). It specifies that investors prefer more relevance than reliability in the earnings information which is consistent with the findings of Barua (2006) and the CFA's assertion (CFA Institute, 2007). Fifth the results also reveal that the quality of earnings and the combined explanatory power of earnings and book value of equity have declined over the sample period. A comparison of earnings and book value explanatory power indicates that the explanatory power of earnings in explaining changes in the market value of equity has decreased while explanatory power of book value has remained relatively constant over time. The results suggest that changes in the value-relevance of book value could not offset the decline in the value-relevance of earnings, resulting in a decline in the powers of these two measures to explain stock price changes. This is inconsistent with the results obtained by Berger et al. (1996), Collins et al. (1997), Burgstahler and Dichev (1997a), Barth et al. (1998), Francis and Schipper (1999), and Whelan and McNamara (2004), who show that decline in value-relevance of earnings is offset by the increase in value-relevance

of book value and the combined value-relevance has not decreased. These results are robust to controls for firm size, leverage, Tobin's Q, systematic risk (beta), operating cycle (OPCYC), growth, and negative earnings (NEPS). Moreover, the results indicate that control variables used in this study are all associated with variation in the value-relevance of earnings and book values. Furthermore, earnings quality, firm size and operating cycle (OPCYC) explain the shift in value-relevance from earnings to book values. The results also confirm that a decline in value-relevance of earnings over time can be explained by a significance decreasing in relevance-based earnings quality attributes. Finally, the empirical evidence confirms that earnings quality increases the market's reaction to the accounting information. It confirms that the quality of accounting information reflects in investors' decision making in valuing firm equity which is consistent with the FASB's assertion.

Chapter 5

Summary and Conclusions

5.1 Introduction

The main purpose of the study is to test whether the quality of earnings improves the usefulness of accounting information in the decision making process. To achieve this purpose, the study examines two interrelated topics. The first topic of the study "*The Qualitative Characteristics of Accounting Earnings and Stock Return*" (chapter 3), assesses the impact of earnings quality on stock returns as a representative for the usefulness of accounting earnings. The relationship between earnings quality and stock returns is assessed by the significant coefficients of earnings quality attributes, both individually and jointly, in a regression against stock returns. To investigate the relative preference of relevance-based versus reliability-based attributes, the study compares the incremental explanatory power of the relevance-based attributes with of the reliability-based attributes.

The second topic of this study, *"The Effect of Earnings Quality on the Value-Relevance of Accounting Information"* (chapter 4), aims to link earnings quality constructs with the equity valuation model. This study hypothesizes that earnings quality constructs provide relevant information in the equity valuation process. The supposition is tested by the expansion of three sets of hypotheses. The first set of hypotheses relates to the comparison of value-relevance of earnings and book value between two portfolios of firms with high relevance & high reliability

(HH) and low relevance & low reliability (LL). The relative importance of relevance or reliability of accounting information in the valuation process is tested by set of Hypotheses 2, which compares value-relevance of earnings and book value between two portfolios of firms with high relevance & low reliability (HL) and low relevance & high reliability (LH). Finally, set of Hypotheses 3 relates to the comparison of the value-relevance of earnings between four portfolios (HL and LH with HH and LL).

This chapter summarises the research and concludes the major findings of the current thesis. Sections 5.2 and 5.3 summarise objectives, methods and the main finding of the research in chapters 3 and 4. Section 5.4 explains the contributions of the study to knowledge. Section 5.5 discusses the implications of the study for market participants, researchers, education, and policy makers. Section 5.6 presents the limitations of the research. Section 5.7 provides suggestions for future studies.

5.2 The Qualitative Characteristics of Accounting Earnings and Stock Return

Chapter 3 of this thesis examines whether the qualitative characteristics of accounting earnings are associated with stock returns. It hypothesizes that stock return is positively associated with the qualitative characteristics of accounting earnings. The study also points to construct a summary measure of earnings quality in the light of the usefulness of earnings related information in making financial decisions. Additionally, the research aims to investigate the relative

strength of relevance-based versus reliability-based attributes in improving the usefulness of earnings information for decision making.

This study considers quality of earnings from the FASB viewpoint and defines earnings quality as the extent to which reported earnings capture both dimensions of qualitative characteristics of accounting information; relevance and reliability. Predictive value, feedback value, persistence, and timeliness measure relevance of earnings information. Abnormal accruals, smoothness of earnings, conservatism and accruals quality are used to measure reliability of earnings quality.

This study investigates earnings quality-return association to evaluate the usefulness of earnings quality information in investor's decision making. This association is assessed by the significant coefficients on earnings quality attributes, individually and jointly, in a regression against stock returns. The study also assesses the incremental contribution of each attribute, in the presence of the others, to explain stock returns. In addition, to investigate the relative importance of relevance-based versus reliability-based attributes, the study compares the incremental explanatory power of the relevance-based attributes with of the reliability-based attributes in explaining changes in stock return. Meanwhile, firm's size, book to market equity ratio, and systematic risk (beta) are also taken into account in the models as factors which affect stock returns.

The results, in respect to control variables, indicate that stock returns are negatively associated with a firm's size which is consistent with the evidence provided by Bagella et al. (2000). While, the positive coefficient for the book-to-market equity ratio (BM) suggests that stock returns are positively related to BM

ratios. This is consistent with the results obtained by Chan et al. (1991), Chui and Wei (1998), Daniel et al. (2001) and Barua (2006). Moreover, the positive coefficient for beta confirms that risk has a positive association with stock returns which is consistent with Barua (2006) and Sinaee and Moradi (2010).

The results about earnings quality indicate that, when earnings quality attributes are considered individually, all but one are associated with the returns of stock in the predicted way; the exception is conservatism. In the presence of the other attributes, the results for the relevance-based show that all relevance-based earnings quality attributes including predictive value, persistence, feedback value, and timeliness are positively associated with stock returns. Among these attributes, earnings persistence has the largest effect on stock returns which is consistent with the results reported by Kormendi and Lipe (1987), Collins and Kothari (1989), and Easton and Zmijewski (1989), who find that more persistent earnings have a stronger stock price response.

The results for the reliability-based earnings quality attributes reveal that abnormal accruals and smoothness, as an inverse measure of earnings quality, are associated with a decrease in the returns of stock, while accruals quality, as a direct measure of earnings quality, is correlated with an increase in the returns of stock. Among reliability-based attributes, accruals quality has the largest effect on stock returns which is consistent with those obtained by Francis et al. (2005). However, conservatism is consistently insignificant. These results are broadly similar to those for the reliability-based earnings quality attributes, obtained one at a time.

The results of the study also show that, when relevance-based and reliability-based attributes are considered jointly, the largest effect is for persistence of earnings, followed by feedback value of earnings in cash flows prediction, accruals quality, predictive value of earnings, abnormal accruals, and feedback value of earnings in returns prediction, conservatism, timeliness, and smoothness. This indicates the relative desirability of earnings persistence to investors over other earnings quality attributes.

An examination of market desirability between relevance and reliability shows that relevance-based attributes explain more of the stock returns variation than do reliability-based attributes. This finding specifies that investors in the decision making process prefer more relevance than reliability related earnings information which is consistent with the findings of Barua (2006). This result suggests that investors may not be able to distinguish reliability of earnings information.

These results support the main hypothesis which states that stock return is positively associated with the qualitative characteristics of accounting earnings. This indicates that investors correctly price earnings quality attribute in their investment decisions. These findings are consistent with the findings by Chan et al. (2006) and Ghaemi et al. (2008), who find that stock returns are affected by accruals quality, as a proxy of earnings quality. The results of this study provide some insights into the role of earnings quality attributes in enhancing the usefulness of earnings information for decision making. Further, the results suggest that earnings quality attributes provide relevant information in predicting stock returns.

5.3 The Effect of Earnings Quality on the Value-Relevance of Accounting Information

This study investigates whether the qualitative characteristics of accounting earnings, constructed in chapter 3, influence the value-relevance of accounting information. The main objective of the study is to link earnings quality with the equity valuation process by assessing its effect on the value-relevance of accounting information.

This study examines the effect of earnings quality on the shift in market reliance from earnings to book value in the equity valuation process. It questions whether investors can differentiate between portfolios of firms with high and low quality earnings in making valuation decisions. The study also compares the incremental explanatory power of earnings and book values and examines the relative importance for relevance or reliability of earnings information in the valuation of equity. Moreover, this study investigates whether any associated trend exists between value-relevance and earnings quality over the study period.

The study supposes that, a higher quality of earnings contributes to improving the relevance and reliability of earnings information, thereby increasing the value-relevance of earnings in valuing a firm's equity. However, a decline in the quality of earnings may shift market reliance from earnings to book value as the basis for valuation purposes.

The study conducts factor analysis on eight earnings quality attributes, systematized in the first part of the study, to construct an indicator of each earnings quality dimension for each firm-year. Earnings attributes representing

predictive value, feedback value, persistence, and timeliness are loaded as the *Relevance* factor, and variables representing abnormal accruals, conservatism, smoothness of earnings and accruals quality are loaded as the *Reliability* factor. Then, by using factor scores, observations are classified into four portfolios: (1) high quality earnings, high relevance and high reliability (HH); (2) low quality earnings, low relevance and low reliability (LL); (3) high relevance and low reliability (HL); and (4) low relevance and high reliability (LH).

This study uses the valuation model improved by Ohlson (1995) which has been applied broadly in the value-relevance literature (e.g., Collins et al., 1997; Burgstahler and Dichev, 1997; Whelan and McNamara, 2004). In his model, firm value is represented by stock price which is dependent on book value of equity and earnings per share. The indicator variables of earnings quality are introduced to the model through the inclusion of slope dummies interacting with earnings and book value of equity. Each dummy variable takes a value of 1 if a firm-year observation is placed in the relevant portfolio (HH, LL, HL and LH), and 0 otherwise. To increase the reliability of the results, the valuation model is re-estimated separately for each portfolio. Moreover, the hypotheses are re-tested by including size, leverage, Tobin's Q, systematic risk (beta), operating cycle (OPCYC), growth, and negative earnings (NEPS), as control variables, in the valuation model.

The study uses the response coefficients on the earnings and book value interaction variables and R^2 as the primary metrics for measuring value-relevance. To compare the explanatory power of earnings and book value, the combined

explanatory power of earnings and book value of equity is disaggregated, using a technique described by Theil (1971), into the incremental explanatory power of earnings, book values, and common to both earnings and book values.

5.3.1 Earnings Quality and Value-Relevance

The result of assessing the base model (Equation (1)) provided by Ohlson (1995) indicates that firm value is positively associated with earnings and book value of equity which is consistent with prior studies (e.g., Collins et al., 1997; Ou and Sepe, 2002; Whelan and McNamara, 2004). This result not only signifies that both earnings and book value are value-relevant in the valuation process but also provides a validation for the valuation framework used in this study.

With the inclusion of the earnings quality interaction variables for the base model, a comparison of the results in the two portfolios indicates that in portfolios of firms with high quality earnings, the value-relevance increases for earnings and decreases for book value compared to portfolios of firms with low quality earnings which is consistent with Hypothesis 1a and 1b.

To identify more clearly the effect of earnings quality on value-relevance, the study also estimates base model (Equation (1)) separately for portfolios of firms with high and low quality earnings. The results show that value-relevance of earnings in the HH portfolio is considerably more than the LL portfolio. However, the results suggest that although book value is value-relevant in firms with low quality earnings, it cannot provide relevant information in the valuation process of firms with high quality earnings. These results provide further evidence to support the Hypotheses 1a and 1b.

One interpretation of the findings is that the market's perception of earnings quality affects the value-relevance of accounting information in valuing a firm's equity. The quality of earnings increases the value-relevance of earnings in equity valuation. However, when earnings quality declines, the market may place less reliance on accounting earnings and focus more on book value as an alternative measure of firm value.

These results provide empirical evidence suggesting that earnings quality increases the market's reaction to accounting information. It not only indicate that earnings quality provides relevant information in the valuation process but also confirms that the quality of accounting information is reflected in investors' decision making which is consistent with the findings of Barua (2006) and the FASB's assertion.

In addition, comparing the adjusted R^2 between the HH and LL portfolios indicates that both earnings and book value of equity jointly explain 41.9% of the variation in stock prices in the HH portfolio compared to 23.7% in the LL portfolio. This finding confirms that the ability of earnings and book value jointly to explain stock price is significantly higher in high quality portfolios compared to low quality portfolios. This provides empirical evidence suggesting that the increase in the value-relevance of book value in the LL portfolio may not exactly offset the decline in the value-relevance of accounting earnings. It results in a decline of the value-relevance of accounting information. This finding is inconsistent with prior studies which indicate that the decline in value-relevance of earnings is offset by the increase in value-relevance of book value (Berger et

al., 1996; Collins et al., 1997; Burgstahler and Dichev, 1997; Barth et al., 1998; Whelan and McNamara, 2004). Moreover, Collins et al. (1997) and Francis and Schipper (1999) confirm that the combined value-relevance of these measures has not declined. However, these studies do not classify firms according to the level of their earnings quality. Therefore, different results could be due to the fact that prior studies take into account the quantity of earnings and ignore its quality in their analyses. However, value-relevance of accounting information can be expected to vary in portfolios of firms with low quality earning compared to firms with high quality earning.

5.3.2 Relative Importance for Relevance or Reliability

A comparison of value-relevance in the HL and LH portfolios indicates that the portfolios of firms with high relevance and low reliability earnings (HL) versus low relevance and high reliability earnings (LH) have significantly different value-relevance of earnings which is consistent with Hypothesis 2a. Further, the results reveal that investors' response is higher for relevance than reliability of earnings information, which is consistent with the findings of the first part of the study in this thesis. Furthermore, the results highlight that investors focus on relevance of earnings information and ignore the reliability of earnings information in making valuation decisions.

To strengthen the reliability of the results, the study also estimates Equation (1) separately for both the HL and LH portfolios. The results indicate that the coefficient on earnings in the HL portfolio is significant. However, it becomes insignificant in the LH portfolio at conventional levels, indicating that high

reliability with low relevance earnings information cannot provide relevant information in valuing a firm's equity. The result also signifies that the market is more sensitive to relevance of earnings information. This finding provides further insights about the key role of earnings information relevance in equity valuation decisions. Moreover, the coefficient on book value is positive for the LH portfolio; however, it becomes negative in the HL portfolio. This result provides further evidence that indicates significant differences in investors' preferences for reliability and relevance of accounting information in the equity valuation process.

In addition, comparing the adjusted R^2 for the HL and LH portfolios shows that earnings and book value of equity jointly explain 39.5% of the variation in stock prices in the HL portfolio compared to 14.5% in the LH portfolio. This confirms that value-relevance of accounting information is significantly higher in the HL portfolio compared to the LH portfolio. This could be interpreted as the relevance of earnings information declines, investors focus on book value and place less reliance on earnings as a base in equity valuation. As a result, earnings and book value respectively become less and more value-relevant. However, since book value of equity is only one of alternate information sources, the increase in the value-relevance of book value cannot compensate a decline in the value-relevance of accounting earnings, resulting in a decline in the combined explanatory powers of earnings and book value in the LH portfolio.

5.3.3 Value-Relevance of Earnings and Book Value in Four Portfolios

A comparison of value-relevance in four portfolios (HH, LL, HL, LH) indicates that firms in the HL portfolio have the largest value-relevance of earnings, while firms in the LH portfolio have the smallest value-relevance of earnings in determining stock price. This is inconsistent with Hypothesis 3a which states that the portfolios of firms with high (low) quality earnings have significantly higher (lower) value-relevance of earnings in comparison with the portfolios of firms with high relevance & low reliability earnings (HL) and low relevance & high reliability earnings (LH). These results suggest that the market in the valuation process takes into account relevance of earnings information but ignores its reliability. This may be due to the fact that the recognition of earnings reliability is very difficult to investors, while recognition of earnings relevance (persistence, predictability, feedback value and timeliness) is very simple. Therefore, this finding could be interpreted as indicating that the market is not able to distinguish reliability of earnings information.

According to Hypothesis 3b, it is expected that the portfolios of firms with high (low) quality earnings have significantly lower (higher) value-relevance of book value in comparison with the portfolios of firms with high relevance & low reliability earnings (HL) and low relevance & high reliability earnings (LH). The results suggest that firms with low quality earnings (LL) have the largest value-relevance of book value (consistent with Hypothesis 3b) and firms with high relevance and low reliability earnings (HL) have the smallest value-relevance of book value in valuing a firm's equity (inconsistent with Hypothesis 3b).

To test the robustness of the results, the study also considers assessing the incremental contribution of each attribute in explaining stock price. The results show that portfolios of firms with high quality earnings (HH) have an incremental explanatory power over five times larger than those with low quality earnings (LL); 18% and 3.2%, respectively. However, the LL portfolio has extremely higher incremental R^2s from book value compared to the HH portfolio (8.4% vs. -0.4%). The results also indicate that firms with high relevance and low reliability (HL) have extremely higher incremental R^2s from earnings compared to firms with low relevance and high reliability (LH), and have slightly higher incremental R^2s from book values.

Furthermore, the explanatory powers of earnings ($EXPE$) in four portfolios specify a pattern where $EXPE_{HL} > EXPE_{HH} > EXPE_{LL} > EXPE_{LH}$. The results also imply a pattern for the explanatory power of book value ($EXPB$), that $EXPB_{LL} > EXPB_{HL} > EXPB_{LH} > EXPB_{HH}$, which provide support for Hypothesis 3b.

These results could be interpreted as broadly supporting the main Hypotheses (1a, 1b, 2a, 2b, and 3b) and the obtained results from considering the estimated coefficients on the earnings and book value interaction variables for the HH, LL, HL and LH portfolios.

5.3.4 Control Variables

The hypotheses were retested using control variables which are known to have an effect on the value-relevance of earnings and book value of equity. These variables include size, leverage, Tobin's Q, systematic risk (beta), operating cycle

(OPCYC), growth, and negative earnings (NEPS). The effects of these factors on the value-relevance of accounting information are controlled through inclusion of indicator variables in the model of value-relevance and earnings quality (Equation (4)). With the inclusion of these factors, value-relevance decreases for earnings while for book value it increases. This result shows that control variables are associated with the shift in value-relevance from earnings to book value of equity. After inclusion of the control variables to the model, the results consistently confirm the role of earnings quality in explaining the shift in value-relevance from earnings to book value.

The results also provide further evidence of the effect of control variables on the value-relevance of earnings and book value of equity. According to the results, firm size is related to variation in the value-relevance of earnings and book values. It indicates that value-relevance shifts from earnings to book values in valuing smaller companies which is consistent with the results obtained by Hayn (1995) and Collins et al. (1997). The finding indirectly suggests that earnings quality is perceived to be poor in small firms. This may lead to a decline in focus on earnings as the basis for valuation purposes. Therefore, for small firms the market may look for book value as an alternative measure of a firm's value.

The coefficient of the leverage interaction variable confirms that firms with a high debt ratio have high value-relevance of earnings which is inconsistent with the findings of Biddle and Seow (1991). The different results could be due to the fact that this research involves both earnings quality and control variables in the model but the mentioned study does not consider the quality of earnings.

However, the results indicate that value-relevance of book value is unaffected by the level of leverage.

The coefficients of the Tobin's Q interaction variables for earnings and book value indicate that performance of firms, as measured by Tobin's Q, is positively associated with the value-relevance of earnings and book value in valuing a firm's equity. For the beta variable, the result is somewhat surprising as it indicates the value-relevance of earnings will increase as a firm's systematic risk increases. The coefficient of the operating cycle (OPCYC) interaction variables for earnings clarifies that in firms with high operating cycle, value-relevance of accounting information shifts from earnings to book value in equity valuation. As predicted, the result indicates that growth of firms increases the overall ability of earnings and book values to explain stock price. The coefficient of the negative earnings interaction variable for earnings and book value suggest that firms with negative earnings experience a decline in the value-relevance of both earnings and book value in equity valuation. The result in relation to value-relevance of earnings is consistent with those obtained by Hayn (1995), Elliott and Hanna (1996), Collins et al. (1997), Basu (1997), and Marquardt et al. (2004).

Overall, after the inclusion of the control interaction variables in the model, the results consistently confirm that the quality of accounting information is reflected in investors' decision making in equity valuation which is consistent with the reported result of the first area of the study and the FASB's assertion. Moreover, the results indicate that control variables are all associated with variation of the value-relevance for accounting earnings and book value of equity.

In addition to earnings quality, firm size and operating cycle may explain the shift in value-relevance from earnings to book values.

5.3.5 Variation of the Value-Relevance of Accounting Information and Earnings Quality over Time

The result of variation trend investigation in the value-relevance indicates that the combined value-relevance of earnings and book value significantly decrease in over the period of the study. The result also signifies that relevance of earnings information significantly declines, while the value-relevance of book value has not a significant change over the study period.

An investigation of variation trend in the quality of earnings reveals that the relevance of earnings information significantly decreases over the study period, while the reliability of earnings information is unchanged over time. These results provide empirical evidence suggesting that a decline in value-relevance of earnings over time can be explained by the decreasing significance of relevance-based earnings quality attributes.

5.4 Contribution of the Research

This study contributes to the current accounting literature concerning the role of earnings quality in improving the usefulness of accounting information. The study documents evidence that earnings quality improves the value-relevance of accounting information.

Although the present study is not the first to examine the effect of earnings quality on the usefulness of accounting earnings, the approach differs from prior

studies. The study contributes to the value-relevance and earnings quality literature in the following ways:

1. Prior studies differ in their views regarding the meaning of earnings quality. Thus, the accounting literature embraces different definitions which usually focus on just one aspect of earnings quality including accruals quality, predictability, the persistence of earnings, the conservatism in reported earnings, the informativeness of earnings and lack of earnings management. This study extends the concept of earnings quality by considering the quality of earnings from the FASB viewpoint. The SFAC No. 2 (FASB, 1980) states that "the primary qualities of accounting information are relevance and reliability, and that to be useful, information must possess both of those qualities". Therefore, this study considers a more complete definition of earnings quality, defining it as the extent to which reported earnings capture both dimensions of the qualitative characteristics of accounting information; relevance and reliability. This definition encompasses different aspects of the earnings quality concept since it considers both primary determining factors of earnings quality; relevance and reliability.
2. To measure earnings quality, a variety of earnings quality metrics are used in the accounting literature. Studies on earnings quality often assess the quality of earnings by using a single element of one dimension of accounting information quality, relevance or reliability. (e.g., Barth et al., 2001; Cohen, 2004; Revsine et al., 2008). Therefore, they do not capture all earnings quality information in their research. To address this problem and corroborate empirical results, this study systematizes earnings quality constructs by using

major elements of both dimensions of accounting information quality, reliability and relevance. The study considers predictive value, feedback value, persistence, and timeliness as a measure of earnings relevance as well as abnormal accruals, smoothness of earnings, conservatism, and accruals quality as a measure of reliability of earnings information. Furthermore, the results of the study provide a further validation for qualitative attributes used in measuring the quality of earnings in this study.

3. The existing literature provide an incomplete picture of returns-earnings association since prior studies usually take into account the quantity of earnings and ignore its quality in their empirical research. In this regard, this study examines the relationship between the qualitative characteristics of accounting earnings and stock return. The overall results confirm that stock returns have a positive relationship with the quality of earnings. These results show that the quality attributes of earnings enhance the usefulness of accounting information for decision making. This contributes to the accounting literature through providing some insights into the role of earnings quality in returns-earnings association.
4. Prior studies in an Iranian context do not provide any empirical evidence in the relative importance for relevance or reliability of earnings information. This is important in the evaluation of accounting standards and selection of accounting alternatives. The present study examines the relative preference for two dimensions of earnings quality attributes and the results reveal that investors prefer relevance of earnings information to its reliability in the decision making process.

5. Studies in connection with earnings quality and stock returns, particularly those on the Tehran Stock Exchange, do not consider control variables, which are known to have an effect on the returns of stock, in their analysis. To increase the reliability of the results, this study, in according with Francis et al. (2002), includes size, book-to-market equity ratio, and systematic risk (beta) as control variables in the models. The results of assessing a base model that comprises only the control variables provide a validation of the model. In addition, the results reveal that stock returns are negatively related to a firm's size, and positively related to book-to-market equity ratio (BM) and systematic risk (beta).
6. Prior study in the recognition of the earnings timeliness usually use Basu's model (1997). According to SFAC No. 2, timeliness refers to the availability of accounting information to users before it loses its capacity to influence decisions (FASB, 1980). In this study, timeliness is measured by the reporting lag, in terms of days, from the end of the fiscal year to the actual earnings announcement date which is more consistent with the FASB's definition. The results indicate that reporting lag on average is around 99 days which is considered timely reporting since it is within the maximum duration allowed by the Tehran Stock Exchange.
7. The present study contributes to the value-relevance literature by linking earnings quality with the equity valuation process by assessing its effect on the value-relevance of accounting information. A review of accounting literature reveals that many studies investigate value-relevance of earnings, without taking into account the quality of earnings. In addition, a few studies

have examined the effect of earnings quality on the value-relevance of accounting information, using a single measure of earnings quality.

This study performs factor analysis method on eight earnings quality attributes and derived summary measures for relevance and reliability of earnings information. This measure is more effective than any of the single measures of earnings quality.

According to derived scores from the factor analysis, observations were classified into four portfolios (HH, LL, HL and LH) by using high and low scores. The results provide evidence suggesting the quality of earnings is relevant information in the equity valuation process.

8. Prior studies have documented that the reasons of the shift in investors reliance from earnings to book value in equity valuation are mainly due to an increase in the occurrence of reported losses (Hayn, 1995) and the extent of extraordinary and abnormal items (Elliott and Hanna, 1996), as well as a decrease in firm size (Wild, 1992). Furthermore, previous studies find that when the reliability of one accounting number is low, other accounting numbers will become more value-relevant (Collins et al., 1997; Berger et al., 1996; Burgstahler and Dichev, 1997; Barth et al., 1998; Marquardt et al., 2004; Whelan and McNamara, 2004).

   The present study contributes to the value-relevance literature by assessing the effect of earnings quality on the relative desirability between the value-relevance of earnings and book value. The result confirms that the relative importance of earnings shifts to book value in the equity valuation of firms with low quality earnings. In addition, the study has investigated the relative

preference for relevance or reliability of earnings information in the equity valuation process. The results indicate that as the relevance of earnings information declines, earnings become less value-relevant and book value becomes more value-relevant in the valuation process.

9. Prior studies (e.g., Berger et al., 1996; Collins et al., 1997; Burgstahler and Dichev, 1997; Barth et al., 1998; Francis and Schipper, 1999; Whelan and McNamara, 2004) find that the decline in value-relevance of earnings is offset by the increase in value-relevance of book value. This study provides evidence that in portfolios of firms with low quality earnings increase in the value-relevance of book value could not compensate the decline in the value-relevance of earnings.

10. The SFAC No. 2 states that if either of the two primary dimensions of accounting information quality, relevance and reliability, is completely missing, the information will not be useful (FASB, 1980). To test this assertion, the study compares value-relevance of earnings in four portfolios (HH, LL, HL and LH). The results imply a pattern for the explanatory power of earnings per share (EXP_EPS), that $EXP\_EPS_{HL} > EXP\_EPS_{HH} > EXP\_EPS_{LL} > EXP\_EPS_{LH}$. This reveals that firms in the HL portfolio have the largest value-relevance of earnings, while firms in the low relevance and high reliability (LH) portfolios have the smallest value-relevance of earnings. This finding highlights the importance of relevance-based earnings quality attributes in improving the usefulness of earnings information in valuing a firm's equity. Further, this provides evidence that the market may not be able to distinguish reliability of earnings information.

The explanatory powers of book value (EXP_BV) in four portfolios specify a pattern where $EXP\_BV_{LL} > EXP\_BV_{HL} > EXP\_BV_{LH} > EXP\_BV_{HH}$, which are consistent with the research expectation. This suggests that firms in the HH and LL portfolio have the smallest and largest value-relevance of book value respectively.

11. The study provides empirical evidence that firm size, leverage, Tobin's Q, systematic risk (beta), operating cycle, growth, and negative earnings are all associated with variation in the value-relevance of earnings and book values. In addition to this, firm size and operating cycle may explain the shift in value-relevance from earnings to book value of equity.
12. Many studies document that the value-relevance of accounting information has declined in recent years (Francis and Schipper, 1999; Lev and Zarowin, 1999; Ely and Waymire, 1999; Graham et al., 2000; Ho et al., 2001; Core et al., 2003; Marquardt and Wiedman, 2004; Thinggaarda and Damkierb, 2008). This study reveals that there is a significant decrease in the combined value-relevance of earnings and book value over the period of the study. Furthermore, decomposition of combined explanatory power indicates that the value-relevance of earning declines over time but there is not a significant change in the incremental value-relevance of book value.

    Investigation of the two dimensions of earnings quality, relevance and reliability, over the period of the study, indicates that relevance of earnings information declines whereas the reliability of earnings information is unchanged. These results confirm that a decline in value-relevance of earnings over time can be explained by the decreasing significance of

relevance-based earnings quality attributes. This contributes to the value-relevance literature on the role of earnings quality in changing the value-relevance of earnings over time.

13. Finally, the study provides empirical evidence suggesting that earnings quality increases the market's reaction to accounting information. This confirms that the quality of accounting information is reflected in investors' decision making when valuing firm equity which is consistent with the FASB's assertion.

5.5 Implications of the Study

This study extends the concept of earnings quality and systematizes earnings quality constructs and measures by using major components of both dimensions of earnings quality, relevance and reliability, specified in the FASB's conceptual framework. Furthermore, it provides a link between equity valuation and earnings quality studies. Additionally, earnings quality constructs are validated by returns-earnings quality association and the role of earnings quality in the equity valuation process. These findings have practical value and important implications for accounting information users. They provide guidelines to market participants, researchers, policy makers, and other accounting information users by enhancing their understanding of earnings quality and its impact on the value-relevance of accounting information.

5.5.1 Implications for Market Participants

The present study provides three important insights for market participants including analysts, shareholders, investors, auditors and professional accountants.

First, the empirical results provide evidence on the role of earnings quality in improving the information content of accounting earnings. Therefore, a firm's earnings quality is value-relevant information that should be considered by market participants when valuing a firm's equity. This highlights the potential valuation error that may arise from a fixation on only quantity of earnings. According to the results of this study, market participants should take into account the quality of earnings in addition to its quantity. Evaluation of the relevance and reliability of earnings information will help them in the optimal allocation of resources.

Second, the study provides comprehensive earnings quality constructs and measures by operationalizing the primary qualitative characteristics of accounting information specified in the FASB's conceptual framework. These constructs assess relevance and reliability of earnings information which may provide market participants with guidance in comprehensive and accurate analysis of a firm's earnings quality.

Third, the results of the control variable analysis provide guidelines to market participants concerning which factors to take into consideration when decision making and valuing a firm's equity.

5.5.2 Implications for Research

This study updates and extends the literature on earnings quality and its effect on value-relevance of earnings. With respect to future research, the results suggest that in empirical studies should be focused on both dimensions of accounting information quality, relevance and reliability, it is necessary to measure complete information about earnings quality. Further, the study links between earnings

quality and the equity valuation process and provides new insights into this important issue to academic research.

The results also indicate a shift away from value-relevance of earnings toward book value as the basis for valuation in portfolios of firms with low quality earnings. Additionally, the findings provide insights into the role of earnings quality in changing the value-relevance of earnings over time. As a result, this study empirically documents that the quality of earnings is value-relevant information that should be considered in future research into the value-relevance of accounting information. Moreover, financial statement analysis textbooks largely focus on the valuation of firms and only a few of them explain the concept of earnings quality. Thus, the findings of this study may contribute to development of the concept of earnings quality and its measurement in academic study.

5.5.3 Implications for Policy Makers

The study provides empirical evidence suggesting that earnings quality increases the market's reaction to accounting information. This confirms that earnings quality information is reflected in investors' decision making which is consistent with the FASB's assertion. The result suggests that standard setters, when evaluating issued standards, can rely upon quality of earning as an indicator of the quality of issued accounting standards.

According to the results, the value-relevance of accounting information in portfolios of firms with low quality earnings is strongly lower than that of portfolios of firms with high quality earnings. This finding suggests that, to

maintain accounting information relevance, accounting standard setters[22] have taken action to enhance the quality level of financial statements which are a primary source of accounting. The study also provides additional insights into the relative strength of relevance-based versus reliability-based attributes in making earnings information useful for decision making. This is important in the evaluation of accounting standards and selection of accounting alternatives by policy makers.

The study also provides further evidence of the gradual decline in the value-relevance of accounting information which is associated with the steady decline in the quality of earnings. This provides support for ongoing regulatory activity aimed at efficiently monitoring financial statements in order to improve the quality of accounting information. In fact, disclosure about earnings quality and its impact on the value-relevance of earnings enhances shareholders' perception of the relevance and reliability of earnings information. Naturally, when stockholders are assured of the quality of financial information, their reaction to that information improves, which will result in an increase in the value-relevance of earnings information.

Finally, the results of this study can be used by the Tehran Stock Exchange (TSE) to increase earnings quality by setting policies and regulations about information disclosure concerning this measure. Obviously, an increase in the quality of earnings will enhance the confidence of investors by reducing the level

[22]Accounting standard setters assert that relevance and reliability make accounting information useful for decision making.

of risk. Furthermore, it will add impetus to the growth and efficiency of capital markets in Iran by constructing an efficient allocation of financial resources and developing investment activities.

5.6 Limitations of the Research

There are a number of limitations in the research process which must be taken into account when interpreting its results. Firstly, the scope of the present study is limited to manufacturing firms listed on the Tehran Stock Exchange (TSE) with fiscal years ending on March 21st (the year end in the Iranian calendar). Therefore, care should be taken in generalizing the results to other firms. In addition, the TSE has different characteristics from other stock markets in terms of size, regulation and number of firms. Thus, generalization of the results to stock markets in other countries must be carried out with caution due to regional economic influences. Nevertheless, the results of this study are mainly similar to those of past research conducted in the UK (Chan et al., 2006) and the US (Barua, 2006), representing a degree of generalizability.

Secondly, the small number of firms listed on the TSE is another concern in terms of statistical conclusion validity. This problem was addressed by applying the pooled data regression method to analysis and calculating earnings quality attributes. However, the reported results are generalized for the entire sample. In fact, due to the small number of firms and the above restrictions for the statistical population there was no possibility of studying each industry separately.

5.7 Suggestions for Future Research

Since providing evidence on the usefulness of earnings information, in making economic decisions, is a major motivation for financial accounting research, future research might extend the value-relevance and earnings quality literature in the following ways:

1. The present study investigates the effect of earnings quality on the value-relevance of earnings and book value which are usually considered as a base in the equity valuation process. Considering the importance of value-relevance in accounting literature, further research could study the effect of earnings quality on the value-relevance of other accounting measures (i.e., cash flow and dividend).
2. The study provides evidence that indicates the gradual decline in the value-relevance of accounting information and earnings quality over the study period. This could be extended through future research by examining systematic changes in the value-relevance of accounting information and earnings quality over a longer time frame.
3. The present study contributes to both the value-relevance and earnings quality literature by using Iranian data. This could be extended through replication of the study especially using international market data which may provide more generalizability of the results as well as insight into market response to earnings quality and its effect on the value-relevance of accounting information.

4. The scope of the present study is limited to manufacturing firms listed on the Tehran Stock Exchange (TSE) with fiscal years ending on March 21st (the year end in the Iranian calendar). Further research could investigate financial sector firms including investment companies, commercial banks, financial companies and insurance companies as well as firms with different fiscal years.

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