

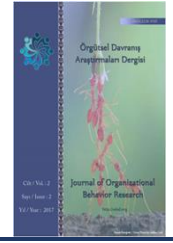


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The economic consequence of earnings persistence, evidence from New Zealand and Iran

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ABSTRACT

Earnings growth sustainability is an important aspect of earnings quality that is very vital for users of financial statements at their financial analysis and decisions, this study aimed to investigate the earnings persistence and related economic consequences in the two economically different environments of Iran a developing country and New Zealand a developed country. Earnings quality is affected by several factors that identifying their effect on earnings quality would be useful in developing better models of earnings quality. In the current empirical research study, determinants of earnings quality have been investigated comprehensively from four dimensions including firm characteristics, business characteristics, economic characteristics, and audit quality. To examine the economic consequence of earnings quality, three variables including the industry-adjusted price-earnings- ratio, industry-adjusted price- book-ratio, and Tobin's Q ratio have been used. This research recruited 135 companies listed on the Tehran Stock Exchange and 38 companies listed on the New Zealand Stock Exchange the investigation period is considered 2006 to 2014. In this study, the exploratory approach has been used to investigate which of the earnings quality determinants have a significant effect on earnings quality. The findings reveal the low earnings persistence of both Iranian and New Zealand companies. Among the earnings quality determinants intangible intensity, leverage, and standard deviation of operating cash flow had a significant relationship with earnings persistence. The results on the economic consequence of earnings quality showed that earnings persistence is only significantly related to Tobin's Q ratio.

Keywords: Earnings persistence, Determinants of Earnings Quality, Economic Consequences

INTRODUCTION

The company earnings quality has diverse dimensions and many studies have been done in the world in line with different dimensions of earnings quality so that the results of some of these researches reveal the important applications of earnings quality for the capital market. In this vein, Ahrens (2010) is a comprehensive research on the quality of earnings that showed the earnings quality has a negative relationship with the capital cost in terms of the accruals quality.



Likewise, according to the type of earnings quality criterion, the relationship between earnings quality and the firm value was different. Nevertheless, earnings persistence is one of the most significant features of earnings quality, which according to the model proposed by Francis et al. (2004) means earnings repeatability and help in improving earnings forecasting and has also attracted the attention of many research studies. Sloan's (1996) research is one of the most influential studies in this field. He inspected the effect of earnings sustainability on cash components compare to the accrual component of earnings in the capital market, and the results revealed further information content for earnings cash component rather than earnings accrual component, these results provide useful applications for the capital market.

The importance of financial reporting quality during the global financial crisis has been confirmed by many research studies. Lin et al.'s (2014) study, conducted in the UK socio-economic environment, they examined the effect of earnings quality during the 2008-2009 global financial crisis. The results of this study confirmed that companies with high-quality earnings are less affected by the negative effects of the financial crisis. Krishnan et al. (2008) showed that customers of Arthur Andersen had lower earnings persistence than customers of other Big5 auditing companies in the pre-bankruptcy period, 1996-2000. Based on the experts' ideas, one of the reasons for the fall of the Tehran Stock Exchange index in 2005 was the price bubble and, as a result, the low quality of financial reporting. This issue has been examined in Hassani and Shahamati's research (2014). In their view, the Tehran Stock Exchange index has grown exponentially between 2000 and 2004, while the index of most major stock exchanges has declined in the world sharply. Likewise, the increase was inconsistent with emerging stock markets. On the other hand, according to Lee (2007), in New Zealand, financial crises have been observed in some years, including the fall of Renshaw Edwards in 1992 and the fall of Feltex in 2006.

earnings quality is affected by numerous factors and identifying and determining the impact of these factors on earnings quality by research studies can be useful in developing better models for earnings quality and better evaluation of earnings quality. In the current study, these factors are comprehensively examined at four levels, including firm characteristics, business characteristics, economic characteristics, and audit quality, and their impact is investigated on the earnings persistence in Iran as a developing country and New Zealand as counterpart developed country Which depicts the contribution of this research project at the literature of this field. The results revealed that only some of the determinants had a significant relationship with earnings persistence. So, it is better to consider these determinants in persistence model development. Also in this research, the relationship between earnings quality and firm value has investigated using three variables, including industry-adjusted PE, industry-adjusted PB, and Tobin's Q ratio, and it was found that only earnings persistence was significantly related to Tobin's Q ratio. This proposes that companies with higher earnings quality are more likely subject to evaluation by the stock markets. These findings are consistent with the results of other research, including Gaio and Raposo (2011).

The rest of the article is as follows. The literature review and hypotheses section, which includes the methods implemented to measure the earnings persistence, the rate used to discount the earnings persistence proxy in ARIMA models, determinants of earnings quality, the economic



consequence of earnings quality. The methods section describes the sample and the variables, the experimental results section, and finally the summary of the results.

Literature review and hypothesis

Earnings persistence (EP) is one of the qualitative features of accounting earnings, research studies such as Ebaid (2010), Pimentel and Lima (2015) have advocated that EP is an important amount for predicting future earnings considering current earnings. The higher the EP is, the higher the earnings quality (EQ) will be. The high persistence of earnings has important benefits for capital market and academics including usefulness for evaluating investments, more useful measure for forecasting future performance, fewer evaluation errors from analysing current earnings and better inputs for equity valuation models (Ebaid 2010, Hee 2011, Pimentel and Lima 2015, Kolozsvari and Macedo 2016). The literature of EQ is extensive; therefore, considering the scope of the study, the literature review puts some light on the selected aspects of the extended literature. In this literature review after discussing the models that have implemented for measuring earning persistence with emphasise on ARIMA Models, the review continued to explain the rate of discount implemented in the calculation of the ARIMA Models. The next section considers determinates of the EQ. The economic consequences of EQ from the accounting theory perspective are presented as the discussion continued.

Methods implemented for measuring EP

The most repeated model recruited for measuring EP include cross-sectional and time-series. This part reviews articles that recruited these models.

The cross-sectional models are used widely in the literature (Sloan 1996, Chen 2004, Richardson, Sloan et al. 2005, Frankel and Litov 2009, Ebaid 2010, Hee 2011, Humayun Kabir and Laswad 2011, Dey and Lim 2015). These models have advantages and disadvantages. The power and lack of survivorship bias are advantages of the cross-sectional model and their disadvantages include the correlation of regression residuals (Hee 2011) and also earnings trends in some companies are fluctuated thus adopting these models for measuring EP is not suitable in such cases. Furthermore, EP may not be measured correctly if lagged independence variables are utilized just for one-period (Cheng and Wu 2013). The general model used in all studies and related to the cross-sectional approach has included earnings before extraordinary items for two consecutive years. In contrast, as explained by IAS 1 extraordinary items should not report separately in the income statement in conclusion these models should be revised accordingly as stated in this international standard.

Some studies used this model focused on market reaction to EP for example researcher studies such as Dey et al, (2015), Richardson et al, (2005), and Chen (2004) have investigated this issue for the US firms. The study of Dey et al, (2015) was the extension of works performed by Richardson et al, (2005) and Sloan (1996). Their findings indicated that mispricing due to the fact that the market does not identify lower EP still, these results are in agreement with conclusions provided by Richardson et al. (2005) and Sloan (1996). In the same area, Chen (2004) studied the reaction of investors to earnings announcements under consideration EP reflected the market overreacted to the low-persistence earnings. Thus according to the above discussion, the results of studies are more or less the same on this issue in the context of the US environment, indicating an impact on the EP on the market and consequently on the investors (Sloan 1996, Chen 2004, Richardson, Sloan et al. 2005, Dey and Lim 2015).



A Group of studies applied the cross-sectional model for surveying EP according to the earnings accrual and earnings cash flow component. Dey et al, (2015), Richardson et al, (2005), and Sloan (1996) reviewed this topic for US firms and Ebaid (2010) surveyed for an emerging capital market in Egypt. Their results reflected lower EP for accrual component of earnings (Sloan 1996, Richardson, Sloan et al. 2005, Ebaid 2010, Dey and Lim 2015).

In this vein, some scholars have considered using ARIMA Models. Implementing these models needs considering a long time horizon of earnings data for this model estimates to be useful (Hee 2011). Research period in some studies is varied from 38 to 9 years (O'Hanlon, Poon et al. 1992, Lipe and Kormendi 1994, Baginski, Lorek et al. 1999, Riahi-Belkaoui and Alnajjar 2002, Pimentel and Lima 2015).

Following some studies performed in the US market such as Lipe and Kormandi (1994), Baginski et al. (1999), Riahi-Belkaoui, and Alnajjar (2002) higher-order ARIMA Models have better explanatory power than lower-order ARIMA Models in the association between EP and economic determinants of persistence. Furthermore, higher-order Models have higher correlations than lower-order Models in the relationship between EP and earnings response coefficient. On the other hand, Pimentel and Lima (2015) achieved different results in an emerging market such as the Brazilian market and their results pointed out that low-order ARIMA Models have acted the same as high-order ARIMA Models in the relationship between EP with earnings response coefficient. In a given ARIMA (p, d, q) Model, p, d, q components are respectively the number of autoregressive components, level of consecutive differencing, and the number of moving average components. On the other hand, the High-order ARIMA Models include (2,1,0), (4,1,0) according to Ahrens (2010), Baginski et al, (1999), Lipe and Kormandi (1994), O'Hanlon et al, (1992), Riahi-Belkaoui and Alnajjar (2002), Pimentel and Lima (2015) while lower-order ARIMA Models include (1,0,0) as explained by Ahrens (2010), Baginski et al, (1999), O'Hanlon et al, (1992), Pimentel and Lima (2015).

According to the structure suggested by the aforementioned authors, ARIMA Models may be classified into two broad clusters of Uniform ARIMA and Firm-Specific Models. Predictability priority and less vulnerable in the face of structural changes of uniform ARIMA Models than firm-specific models is confirmed by some studies (Baginski, Lorek et al. 1999). Research studies such as O'Hanlon et al. (1992) believed that those types of ARIMA Models that recruited for calculating proxy of Ep for each firm is related to the standard deviations of the residual terms and t-ratios of the coefficient estimates of the proposed models. Also, the earning capitalisation rate affects the measure of EP for each firm. Thus, they used both company specific earnings and a uniform class of earnings ARIMA Models in the UK companies and compared the results of the implementation of both Models. The findings indicated that firm-specific Models have higher correlations than uniform ARIMA Models in the relationship between the cumulative abnormal return and the adjusted earnings surprise measures that are reflecting cross-sectional differences in persistence (O'Hanlon, Poon et al. 1992).

Roller regression is another time series model. Researchers such as Francis et al. (2004) used the roller regression method to calculate EP. This model is estimated by the regression of current period earnings to previous period earnings. The use of the ARIMA model is limited due to the need for long data flow, so in this study, the roller regression method was used.

Rate used for discounting proxy of EP in ARIMA Models



The Rate of discount is a factor for converting the impact on future earnings caused by current earnings to present value. The Persistence based on an ARIMA (p, d, q) Models is a function of the autoregressive and moving-average parameters. These Models measured persistence as the present value of the contributing in future earnings by current earnings. (O'Hanlon, Poon et al. 1992, Lipe and Kormendi 1994, Baginski, Lorek et al. 1999, Riahi-Belkaoui and Alnajjar 2002, Ahrens 2010, Pimentel and Lima 2015).

Studies performed in the US market considered discount rate equal to 10% (Lipe and Kormendi 1994, Baginski, Lorek et al. 1999, Riahi-Belkaoui and Alnajjar 2002, Ahrens 2010) without explaining how this rate is determined. O'Hanlon et al. (1992) used the earnings capitalisation rate as the discount rate for computing EP in the UK market. Pimentel and Lima (2015) employed the average annual interest rate for calculating EP in the Brazilian market because risk-free interest rates are high and fluctuated overtime in the Brazilian market. The higher the interest rates are, the lower the parameter of EP will be (Pimentel and Lima 2015). Table 1 presents a summary of discount rates used by previous studies, in the selected countries.

Table 1: Discount rates implemented in the ARIMA Models

Author	Year	Country	Discount Rate
O'Hanlon et al.	1992	UK	The earnings capitalisation rate
Lipe and Kormandi	1994	US	10%
Baginski et al.	1999	US	10%
Riahi-Belkaoui and Alnajjar	2002	US	10%
Ahrens	2010	US	10%
Pimentel and lima	2015	Brazil	The average annual interest rate



Determinants of EQ

Determinants of EQ have been considered in the econometric models included in the research of EQ provided by scholars such as Baginski et al. (1999), Kwon and Yin (2013), Riahi-Belkaoui and Alnajjar (2002), Chen (2004), Cohen (2004) and Martínez-Ferrero (2014). Determinants of EQ are variables that impact the EQ of the firm (Siegel and Shim 1981) as well as the EQ in both countries. According to the above discussion, the first research hypothesis is:

H1: There is a statistically significant difference between the calculated EP in New Zealand and Iran's environment.

Conforming to Ahrens (2010) determinants of EQ can be classified into four levels: firm characteristics, business characteristics, economic characteristics, and auditor quality.

Firm characteristics

Variables related to firm characteristics include firm age, firm size, growth opportunities, capital structure, diversification, security issuance, and the same.

age

Ahrens (2010) and Gu et al. (2005) considered firm age as one of the EQ determinants in the research projects. Earnings management may occur less in older firms because their performance is predictable by capital market participants and any large deviations from their normal performance can easily be detected.

size

firm age has a high correlation with firm size which is normally measured by total assets as proxy. Based on the findings of Gu et al. (2005), firm age is positively related to EQ while firm size impacts the coefficient of firm age in this relationship. They reported that the coefficient of firm age became much larger and more significant after size is removed (Gu, Lee et al. 2005, Ahrens 2010). Furthermore, the growth rate of the firm is related to the firm size variable. The larger the firm is, the lower the growth rate will be while the performance of the firm is more stable. In conclusion, earnings of the large firms are more persistent than the earnings of the small firms (Baginski, Lorek et al. 1999, Gu, Lee et al. 2005). Finally, it is worth saying that according to Baginski et al. (1999), Cohen (2004) and Gu et al. (2005), firm size is positively related to EQ.

Growth opportunities

The effect of growth opportunities on the EQ is traced by a lot of research studies. Innovation is one of the important factors for firm's growth. The innovation relies on intangible knowledge therefore with regard to the above explanations, firm's performance is more volatile in the growing firms. Consequently, growth opportunities might be negatively related to EQ (Cohen 2004, Ahrens 2010). The EQ literature shows different results about growth opportunities as measuring approaches of EQ are different in various research studies. According to Gu et al. (2005), growth is negatively related to EQ while Cohen (2004) advocated that the relationship of growth opportunity and the firm's financial reporting quality is not significant.

Capital structure

There are different perspectives in the literature about the effect of capital structure on the EQ. The first stream of viewpoint states that the high leverage could be considered as an indication of high fixed interest expense that leads to increase earnings variability; as a result, EQ decreases. From another standpoint, high leverage causes an increased demand for monitoring and higher agency costs (Siegel and Shim 1981, Cohen 2004, Ahrens 2010). Nevertheless, both perspectives have enough research supports by scholars such as Cohen (2004) and Gu et al. (2005).

Diversification

The extant literature shows no consensus about the effect of diversification on the quality of accounting information. According to some studies, diversified firms have more agency problems. Consequently, EQ is lower in diversified firms. From another perspective, earnings is more persistent in highly diversified firms (Ahrens 2010, Nußmann 2017). Cohen (2004) indicated that diversification is negatively related to firms' financial reporting quality.

security issuance

Studies investigated the firm's activity in the financial market have confirmed that managers provide accounting information about EQ when they want to raise capital. It can be concluded that EQ is positively related to security issues as proved by Ahrens (2010) (Ahrens 2010).

Business characteristics

It is worth saying that variables related to business characteristics including product type, competition, capital intensity, operating cycle, business variability, intangibles intensity, inventory level and etc are industry factors (Ahrens 2010).

Product type

According to Ahrens (2010), Baginski et al. (1999) product type in terms of being durable or nondurable affect EP in different ways. Demand variation for durable products is more than



nondurable products and so EP is lower for firms with durable products. The negative effect of durable products on the EP is confirmed by Kwon and Yin (2013) and Baginski et al. (1999).

Competition

The literature has argued the effect of competition level in the industries on the accounting information quality from different aspects. A comment has linked the competition level to the variability of return rates. According to this view more competition suggests more volatility of return rates. Subsequently, the sustainability of earnings will be lower. Another perspective has associated the competition level to proprietary costs. The firms consider providing less quality information in the competitive industries because high-quality disclosure due to rivals leads to proprietary costs (Baginski, Lorek et al. 1999, Cohen 2004, Ahrens 2010). However, the results of some research such as Cohen (2004) has failed to confirm the negative effect of competition on the EQ.

Capital intensity

Due to the surveys performed by Ahrens (2010), Chen (2004), Cohen (2004), and Baginski et al. (1999), there are different perspectives about the impact of capital intensity on EQ. Some researchers commented that firms with high capital intensity have high fixed costs. For that reason, when demand rises, increasing capacity became a challenge to meet the level of the demand therefore earnings volatility increases. From another angle, capital intensity is related to barriers-to- entry industry. High capital intensity is one of the factors that raise barriers-to- entry industries. Increasing barriers-to-entry industry leads to decreasing competition. Therefore, EQ increases. The research results are contradicted on the effect of capital intensity on the accounting information quality. Baginski et al. (1999) and Kwon and Yin (2013) found that the capital intensity is negatively related to EP but Cohen (2004) indicated that the capital intensity has a positive effect on the financial reporting quality.

Operating cycle

Based on the ideas of Siegel et al. (1981), Cohen (2004), Gu et al. (2005), and Ahrens (2010) operating cycle is one of the liquidity measures. When the operating cycle is long, the liquidity position is poorer, while uncertainty is higher. In such circumstances, the variability of accruals is higher. Therefore, EQ decreases. Cohen (2004) and Gu et al. (2005) confirmed the negative effect of operating cycle on the financial reporting quality in their research.

Business variability

The scholars such as Ahrens (2010) and GU et al. (2005) measured business variability by variability of cash flow and sales. The high fluctuation of cash flow and sales leads to high uncertainty and more variability of accruals. Therefore, it can be concluded that the EP decreases.

Intangible intensity

Intangibles intensity is used by many researchers in the literature such as Kwon and Yin (2013), Ahrens (2010), and Baginski et al. (1999) as one of the EQ determinants. Based on the ideas of Ahrens (2010) and Kwon and Yin (2013), intangibles intensity is one of the barriers-to- entering industry. High intangibles intensity is one of the factors that raised barriers-to- new coming industry. Increasing barriers-to-new coming industry leads to increase EP. likewise, Ahrens (2010) states that high intangibles intensity decreases the value-relevance of accounting information. Baginski et al. (1999) proved that intangibles intensity is positively related to EP.



On the contrary, Kwon and Yin (2013) found that intangibles intensity is negatively related to EP.

Inventory level

As explained by Ahrens (2010), there are two views about the effect of inventory level on the EQ. The view explaining that a high level of inventory leads to smoother earnings and as a consequence the existence of smooth earnings increases EP. The second view states that a high level of inventory may be an indicator of obsolete inventory. Obsolete inventory may lead to reporting poor quality earnings. Nonetheless, Ahrens (2010) found that inventory level is negatively related to EP.

Economic characteristics

Variables related to economic characteristics including performance, performance variability, loss reporting and etc are connected to the operating environment of the firm.

Performance

Based on the findings of Ahrens (2010) and Cohen (2004), the performance level affects the quality of information disclosure. High-performance firms tend to report quality information which reduces information asymmetry and enclosing market competition. Thus, the firm performance level is positively related to EQ. Likewise, Ahrens (2010) mentioned that high-performance firms in non-competitive industries incline to report low-quality information due to the lack of the existence of competitors. Cohen (2004) found that the performance level of the firm is negatively related to financial reporting quality.

Performance variability

In addition to performance, performance variability also affects EQ. According to Ahrens (2010), high-performance variability leads to lower predictability of future performance that ultimately decreases EQ.

Loss report

Losses are temporary because they are caused by negative shocks in the company's operating environment; consequently, they reduce the earnings predictability, which leads to lower earnings quality.

Auditor quality

It is prominent in the literature that audit quality affects earnings management and unintentional estimation errors. High-quality audit reduces discretionary accruals and so EQ increases. According to previous studies, audit firm size is positively related to audit quality, therefore recurring large audit firm increases EQ (Francis, Maydew et al. 1999, Ahrens 2010, Yasar 2013). Francis et al. (1999) confirmed that audit quality has a positive effect on the financial reporting quality in the NASDAQ firms however Yasar (2013) was not able to confirm this relationship in the Turkey environment.

The economic consequence of EQ

Earnings are the main aspect of valuation. Discussions in the early 1930s revealed the importance of the P/E multiple for firm valuation. These discussions are reasonable when considering one of the firm valuation models including dividend discount model, discounted cash flow model, or residual income model. Nevertheless, these models are complex to be implemented. The basis of the formation of the residual income model arises from multiples such as P/E and the price to book value (P/B). Consequently, users are able to evaluate firms by



reviewing these multiples. However, as recommended in the literature, surveying multiples is easier than analysing complex models (Dechow and Schrand 2004, Schreiner 2009). According to the above explanations and considering that valuation models are related to earnings, EQ affects firm value. Therefore, many studies such as Ahrens (2010), Siegel and Shim (1981), Gaio and Rapso (2011) considered firm value as the economic consequence of EQ. Thus, the second hypothesis of the study is:

H2: EP is significantly related to the firm value in the New Zealand and Iranian listed companies. In this hypothesis, the firm value includes the industry-adjusted price-earnings- ratio, industry-adjusted price- book-ratio, and Tobin's Q ratio.

The EQ literature in the field of the economic consequence of EQ includes economic consequence of both EQ and determinants of EQ. Also, various studies have employed different proxies for the economic consequences of EQ. This section is reviewing studies in this field.

The measure of economic consequences of EQ according to the literature includes different proxies such as the cost of capital, P/E ratio, firm's bid-ask spread, dispersion in analysts' earnings forecasts, number of analysts following the firm, market to book ratio, Tobin's Q, price-to-book ratio, the market value of equity, analysts' forecasts, enterprise value, industry-adjusted earnings-price-ratio, and industry-adjusted book-price ratio (Siegel and Shim 1981, Hossain, Prevost et al. 2001, Prevost, Rao et al. 2002, Cohen 2004, Francis, LaFond et al. 2004, Orr, Emanuel et al. 2005, Chan, Lin et al. 2009, Ahrens 2010, Bhuiyan 2010, Gaio and Raposo 2011, Martínez-Ferrero 2014). The results are different for various measures of economic consequence and EQ. However, results about the effect of the information quality on the cost of capital are controversial. For example, Cohen (2004) after controlling for endogeneity problem found that higher quality of financial information does not lead to lower cost of equity capital while Francis et al. (2004) and Chan et al. (2009) despite the use of different measures for EQ indicated that higher quality of financial reporting leads to lower cost of equity capital. Some scholars such as Ahrens (2010) used several proxies for each measure of EQ and recruited several models for reviewing the effect of EQ on the cost of equity capital. According to his results proxies of EP had a contradict effects (one positive and one negative) on the cost of equity capital when employing the OLS model but none of the proxies of EP were significant when implementing Fama/MacBeth model. Also, his findings echoed that predictability and accrual quality are negatively related to the cost of equity capital when using the OLS model, however, the predictability was not significant with Fama/MacBeth model. The above results reveal that the effect of EQ on the cost of equity capital differs due to different proxies of EQ and different models implemented. Presumably, the effect of EQ on the cost of equity capital may differ in different justices and economic settings such as Iran and New Zealand.

Studies about the effect of EQ on the firm value obtained the same results in spite of using various proxies for firm value and EQ and when performing research at the international level. Therefore, Siegel and Shim (1981), Martínez-Ferrero (2014), Gaio and Raposo (2011), Bhuiyan (2010), Orr et al. (2005), Hossain et al. (2001), Prevost et al. (2002) advocated that higher quality of earnings leads to a higher value of the firm. Some of these studies such as Gaio and Raposo (2011) considered the aggregate measure for EQ by including seven measures. Using aggregate measure for obtaining reasonable and reliable results is preferable than using each measure alone because each measure includes an aspect of EQ. Proxies employed for firm value in these studies include P/E ratio, market to book ratio, Tobin's Q ratio, P/B ratio, enterprise



value, and market value of equity. Some of these research projects such as Siegel and Shim (1981), Bhuiyan (2010), Orr et al. (2005), Hossain et al. (2001), Prevost et al. (2002) substitute determinants of EQ as a measure of EQ including corporate governance, the growth rate in earnings, beta, dividend policy, earnings volatility. Nevertheless, some other studies indicated the effect of determinants on the EQ for example corporate governance is one of the determinants of EQ. This issue confirmed by the results of some research so that Bhuiyan (2010) in his study in the New Zealand market found that high corporate governance leads to high EQ and this will lead to an increase in firm value. The results of Ahrens (2010) were different in some measures of EQ. For example, EP was negatively related to firm value while the results of most measures reflected a positive effect of EQ on the firm value. Moreover, the results of studies by Ahrens (2010), Cohen (2004) indicate that high quality of earnings is positively related to forecasting accuracy of analysts and is negatively related to the dispersion and uncertainty in analysts' earnings forecasts. Therefore, the high quality of earnings has a positive effect on the firm information environment and leads to more precise earnings forecasts analysts. According to the above discussion, high quality of earnings has positive economic consequences for the firms including increasing firm value, decreasing the cost of equity capital, increasing forecast accuracy of analysts. Therefore, the last research hypothesis of the current study is:

H3: The effects of economic consequences of EQ are statistically different in the New Zealand and Iran environment.

Methods

Data and sample

In the case of Iranian companies, the research variables were extracted and calculated from the software of Novin Rahavard, the companies' financial statements, the reports of the board of directors available on the Codal site and the security & exchange organization site (seo.ir). The statistical population of the study is all companies listed on the Tehran Stock Exchange, except for companies in the financial sector, which include insurance, investment, leasing, holding and banks, and companies that had the following characteristics were removed from the sample:

- 1- their information is not available.
- 2- Not be active in the stock exchange and securities during the research period
- 3- The end of the company's fiscal year is not March 19 because firms' data is more comparable, and March 19 is the end of the fiscal year for most Iranian firms.

Based on the above conditions, the companies that had the necessary conditions were 135 companies that constitute the statistical sample of the research. The research period has been considered from 2006 to 2014. Due to the approval of the Securities Market Act 2005 and the revision of the Accounting Standards in 2006, the research period began in 2006. The industrial classification of Iranian companies based on ISIC (International Standard Industrial Classification)

information about New Zealand companies is collected from both Bloomberg and NZX website. Industry classification for New Zealand companies based on Bloomberg classification, the GICS (Global Industry Classification Standard) classification was used, and companies with the following characteristics were eliminated:

1. Financial, insurance, investment, and holding companies



2. Real estate companies were eliminated because they did not have the variables needed for research
3. Overseas companies

Of the 155 companies listed on the New Zealand Stock Exchange between 2006 and 2014, 61 companies had sample features while 38 of them had the required research information. The year of starting research has been selected as 2006 for New Zealand companies to match Iranian companies.

Models development

Sustainable earnings due to reproducibility from analysts' ideas and users of financial statements are considered desirable (Francis et al., 2004). To measure the earnings persistence according to Francis et al. (2004), regression of earnings future values on its current values has been used as follows:

$$X_{t+1} = \alpha_t + \beta X_t + \varepsilon_t \quad (1)$$

In this model, β is earnings persistence. If β is close to one, the earnings will be more sustainable.

$$\text{Per} = \beta \quad (2)$$

To standardizing, the variables of the model were divided at the beginning assets of the period. This model is a time series model that is estimated at the level of each company. Determinants of earnings quality in econometric models related to earnings quality research have been considered, which have been studied by researchers such as Beginski et al. (1999), Kwon and Yin (2015), Riahi Belkaoui and Al-Najjar (2002), Chen (2004), Cohen (2004), Ahrens (2010) and Martinez (2014). Determinants of earnings quality are variables that affect the quality of earnings of the company (Siegel and Shim, 1981).

According to Ahrens (2010), the determinants of earnings quality were classified into four levels: firm characteristics, business characteristics, economic characteristics, and audit quality.

Firm characteristics

Variables related to firm characteristics include firm age, firm size, growth opportunities, capital structure, and diversity.

age

The older the company, the more stable the earnings and therefore the better the quality of earnings. The proxy used for it (age) is equal to the number of years from the beginning of the establishment.

size

The larger the company, the more influence it has on the market, and consequently the better its continuity and predictability. two proxies are considered for measuring it.

Size₁ = Natural logarithm of total assets at the end of the year (3)

Size₂ = Natural logarithm of the market value of the company's capital at the end of the year (4)

Growth opportunities

Growth makes the company's future performance more volatile and, as a result, decreases earnings sustainability. The proxy used for growth is demonstrated at equation (5) where REV is the company's sales revenue:

$$\text{Gr} = \frac{\text{REV}_t - \text{REV}_{t-1}}{\text{REV}_{t-1}} \quad (5)$$

Capital structure



Higher debt ratios in the capital structure lead to more fluctuations in earnings, which leads to a reduction in real earnings quality. On the other hand, due to more debt in the capital structure, companies with high leverage have more demand for control, as a result, the quality of earnings increases. The proxy used for the leverage ratio is:

$$Le = \text{debt} / MV \quad (6)$$

In this relation, debt is the beneficial debts and MV is the market value of the company.
variety

Companies have more stable earnings with more segments, thus increasing the quality of earnings. The proxy used for it is the dummy variable (Di). For companies with several subsidiaries operating in different industries, zero, and for companies without a subsidiary or a subsidiary or several subsidiaries operating in an industry number 1 is considered.

Business

characteristics

Variables related to business characteristics that are specific to the industry include product type, capital intensity, business variability, intangible intensity, and inventory level.

Product type

Consumer goods and services than on durable goods are in constant demand, so the sustainability of the earnings for companies with consumer goods and services is more stable and the quality of earnings is higher. The proxy used for this variable is the PT dummy variable when the company operates in consumer goods and service industries it is 1, otherwise zero.

Capital intensity

There are two views about this variable. The first view is that companies with high capital intensity need to invest more in fixed assets that lead to high fixed costs and due to high fixed costs in line with demand cannot change their capacity quickly. Consequently, capital intensity companies face higher volatility of earnings, which leads to a reduction in the sustainability of earnings. In the second view, capital intensity industries have less competition, and rates of return in a non-competitive environment are more stable, thus the quality of earnings increases. The proxy used for capital intensity is:

$$Cap = PPEN / TA \quad (7)$$

In the above equation, PPEN and TA are stand for Net property, plant and equipment and the sum of assets respectively.

Business variability

Business variability is signified by the variability of cash flows and sales. The higher they are, the lower the operational stability of companies, thus leading to lower earnings quality. There are two proxies for *business variability*:

$$Sv: \text{Net standard deviation of sales to assets} \quad (8)$$

$$Cv: \text{Standard deviation of operating cash flow to assets} \quad (9)$$

The standard deviation is calculated for 7 years.

Intangible intensity

Intangible intensity is directly related to product innovation and diversity. Consequently, companies with high intangible intensity face high barriers to entering the industry and have low competition, thus the earnings quality increases.

$$Int = (RD + ADV) / REV \quad (10)$$



In this equation, RD is the R&D cost, ADV is the cost of advertising and marketing, and REV is sales revenue.

Inventory level

High inventory levels lead to smoother earnings, which ultimately leads to increased earnings sustainability. On the other hand, inventory levels may be unrealistically high due to obsolete items, so the company's continuity may be faced with problems and earnings flow stability may be misleading. The proxy is as follows:

$$INV = \frac{(INV_t + INV_{t-1})/2}{REV_t} \quad (11)$$

In equation 11: REV is sales revenue and INV is inventory.

Economic characteristics

Variables related to economic characteristics that relate to the company's operating environment include performance variability and loss reporting.

Performance variability

The variability of past performance leads to the inability to predict future performance and a reduction in the earnings quality, the proxy of which is as follows:

$$EV = \text{Standard deviation of earnings that have been scaled to assets} \quad (12)$$

The standard deviation is calculated for 7 years.

Loss report

To measure this variable, the Lo dummy variable is used, which is 1 if the company has a loss otherwise zero.

Audit quality

Auditing with high quality prevents intentional manipulation and unintentional errors, thus increasing the quality of earnings. The proxy used for it is the Au dummy variable, which indicates the type of audit firm. In the case of Iranian companies, if the auditor is an audit organization, it is equal to one, otherwise zero. For New Zealand companies, if the audit firm is a member of BIG 4, it is equal to one, otherwise zero.

To determine the importance of determinants of earnings in explanation of the characteristics of earnings (Francis et al., 2004), finally, the relationship between earnings persistence and determinants according to Ahrenz (2010) is determined based on the following regression:

$$Per = \alpha + \beta Det_{it} \quad (13)$$

Det_{it}: A vector of determinant values for each company *i* in the year *t*

The model is estimated using panel data. F-Limer and Hassmann tests were used to identify the type of regression model. Breusch-Pagan test was used to test the integrated data model against random effects. Likewise, the regression underlying assumptions were examined.

In this study, In order to examine which of the earnings quality determinants have a significant effect on earnings quality, the exploratory approach has been used, which means that to inspect each of the earnings quality determinants, the corresponding variable is kept in the model and other non-significant variables, due to the maximum p-value is removed from the model in order until the other variables remaining in the model are significant.

The economic effect of earnings quality indeed reveals how much earnings quality can affect firm value. Following studies done by Bao et al. (2004), Ahrens (2010), Francis et al. (2008), Persakis et al. (2015), Gaio and Raposo (2011), for the value of the company, three proxies have been used, including industry-adjusted price-earnings- ratio, industry-adjusted price- book-



ratio and Tobin's Q ratio. The price-to-earnings ratio is used to estimate the model, and the price-to-book value ratio and the Tobin's Q ratio is used to analyze sensitivity. The industry's adjusted PE is derived from the firm PE difference with the industry's median PE. The industry's adjusted PB is derived from the firm PB difference with the industry's average PB, and the ratio of Q Tobin is equal to the sum of market value and corporate debt is divided by the total assets. Models related to the relationship between firm value and earnings quality criteria based on Ahrens (2010):

$$\text{IndPE}_{it} = \alpha + \beta \text{Per}_{it} + \gamma \text{Det}_{it} + \varepsilon_{it} \quad (14)$$

$$\text{IndPB}_{it} = \alpha + \beta \text{Per}_{it} + \gamma \text{Det}_{it} + \varepsilon_{it} \quad (15)$$

$$\text{Tobin's Q} = \alpha + \beta \text{Per}_{it} + \gamma \text{Det}_{it} + \varepsilon_{it} \quad (16)$$

Where:

IndPE: The industry-adjusted price-earnings- ratio

IndPB_{it}: The industry-adjusted price- book-ratio

Det: Includes vector of the determinants for each firm i in year t.

Per: stand for earnings persistence

These regressions were also estimated using panel data.

Empirical results

Table 2 demonstrates the average, minimum and maximum values for each of the variables determining the quality of earnings, earnings persistence, and value of the firm in Iran (IR) and New Zealand (NZ).

Table 2: Descriptive statistics

variable	Mean of IR	Mean of NZ	Min of IR	Min of NZ	Max of IR	Max of NZ
per	.201	.258	-.901	-.561	.906	1.473
Le	.609	.521	.000	.00	12.063	8.578
Cap	.229	.357	.019	.001	.825	.906
Sv	.188	.159	.034	.003	1.008	.723
Inv	.309	.1	.045	.00	1.465	1.164
Int	.006	.04	.000	.00	.078	1.931
Age	38.133	52.026	12	8	63	174
Ev	.062	.079	.006	.004	.241	1.102
Cv	.171	.072	.011	.005	36.119	1.071
Size 1	27.732	19.433	24.308	15.266	32.270	22.735
Size 2	27.504	19.202	24.432	14.307	32.269	22.521
Gr	.295	.229	-.602	-.826	4.651	10.789
Pe	11.964	.782	-142.537	-174.652	1705.24	174.653
Pb	.491	.311	-33.708	-2.339	119.714	16.634
Tobin's Q	1.67	1.709	.584	.507	6.528	18.964

According to Francis et al. (2004), if the value obtained for earnings persistence is close to one, it designates high earnings persistence. According to Table 2, the average earnings persistence of New Zealand companies (0.258) is higher than Iranian companies (0.201), so that earnings

persistence in both countries is low, while it was expected that New Zealand to have high earnings sustainability as a developed country. Internationally, earnings sustainability in developing countries is lower than in developed countries. Ebaid (2010) found that the earnings persistence of Egyptian companies was 0.6837 which is higher than that of Iranian companies, but lower than the earnings sustainability obtained by Sloan (1996) for American companies, which is 0.84. Earnings persistence is influenced by determinants of earnings quality, and this has led to the sustainability of the different earnings of New Zealand compared with the Iranian companies that can be summarized in the following paragraphs. The capital intensity of New Zealand companies is higher than that of Iranian companies so that the fixed assets of New Zealand companies from 35.7 percent of their total assets, but the fixed assets of Iranian companies make up 22.9 percent of their total assets. The average age of New Zealand companies is 52.026 years and the average age of Iranian companies is 38.133 years, and according to Ahrens (2010) the older the company, the more stable the earnings. The minimum, maximum, and standard deviation sizes of the firm based on the logarithm of assets are 24.308, 32.27, and 1.34 for Iranian companies and 15.266, 22.735, and 1.92 for New Zealand companies, respectively. The presence of the sample companies in this range in terms of size indicates that sample companies vary in size.

To test the first hypothesis about the significance of the difference in earnings persistence of companies in Iran and New Zealand, the Mann-Whitney test was used, so that the average earnings persistence per year for both countries during the research period was calculated and to test their significance the Mann-Whitney was used.



	per
Mann-Whitney U	1.000
Wilcoxon W	7.000
Z	-1.528
Asymp. Sig. (2-tailed)	.127
Exact Sig. [2*(1-tailed Sig.)]	.200 ^a
Exact Sig. (2-tailed)	.200
Exact Sig. (1-tailed)	.100
Point Probability	.050
a. Not corrected for ties.	

According to Table 3, the sig. value is greater than 5%; consequently, the null hypothesis is accepted. So, it can be said that the averages of the two societies are not significantly different. Thus, the first hypothesis that there is a significant difference in the values of earnings persistence of both countries is rejected.

Table 4 reveals the effect of each of the determinants of earnings quality on earnings persistence in both Iran and New Zealand by the exploratory method.

Table 4: Regression coefficients of determinants on earnings persistence

Per = α + β Det_{it}				
variable	Coef of IR	p-value	Coef of NZ	p-value

Le	.0108	.573	.08659	.0149
Int	.912	.681	.48218	.0022
Cap	-.137	.394	.217	.141
Sv	.065	.743	-.2998	.238
Inv	-.0853	.432	-.35	.228
Di	-.059	.394	.157	.129
Au	.023	.72	-.0099	.944
PT	-.05	.41	-.0258	.793
Age	.0015	.497	-.0009	.335
Ev	-.687	.259	-.398	.166
Cv	-.007	.438	-.696	.0468
Lo	-.008	.9	.05	.588
Size1	.02	.335	.0253	.258
Size2	.005	.733	.02	.355
Gr	.029	.382	-.014	.57
R ² model	.029		.284	
p-value model	.607		.0637	
MSPE	.1749		.1018	

According to Table 4, the model is not significant for Iranian companies. In the case of New Zealand companies, at the 90% confidence level is significant. The explanatory rate for earnings persistence is 28.4%. Likewise, the explanatory percentage for different studies varies due to differences in the number and type of variables used for determinants. For instance, in the study of Francis et al. (2004), determinants explain 15% of earnings persistence variability, 24% of the variability in predictability, and 33% of the volatility of earnings smoothing. Considering all the determinants, leverage, intangible intensity and the variability of operating cash flow have a significant relationship with earnings persistence. According to Table 4, leverage is directly related to earnings sustainability, which is not consistent with Ahrens's (2010) results in this field. So that, theoretically, according to Ahrens (2010), due to more debt in the capital structure, companies with high leverage have more demand for controlling, so the quality of earnings increases.

In the same way, the variability of operating cash flow has a negative and significant relationship with earnings persistence is consistent with Ahrens's (2010) results but does not consistent with the results of Francis et al. (2004). Therefore, theoretically, the higher the standard deviation of operating cash flow, the more negative the effect on earnings quality, this indicates that companies have lower operating stability. Results indicating that the intangible intensity has a positive and significant relationship with earnings persistence, which is not related to the results of Francis et al. (2004) and Ahrens (2010) in this field. So that, theoretically, according to Ahrens (2010), higher levels of intangible intensity indicating higher product innovation and variability. So that leads to higher barriers to entry into the industry and leads to higher continuity. As it is clear from the results, the impact of determinants of earnings quality varies in different environments, and a consistent theory cannot be proposed.

Table 5 reveals the relationship between earnings persistence and each of the firm value criteria.

Table 5: Regression coefficients of earnings persistence on firm value

variable	Coef on $pe(IR)$	Coef on $pe(NZ)$	Coef on $pb(IR)$	Coef on $pb(NZ)$	Coef of Tobin's Q(IR)	Coef of Tobin's Q(NZ)
intercept	-25.455	-5.48	-8.99	-.556	2.23***	1.343**
Per	9.41	-10.03	1.08	-.236	.081*	-.152
Le	-6.647	1.067	.017	.417***	.288***	.415***
Cap	.408	-20.94	2.12	-.569	-.256**	.156
Sv	-57.25	-20.44	2.68	-.188	.003	.753**
Inv	.514	16.779	-1.4	-1.06*	-.155	-.405
Di	13.09	-2.987	.59	-1.08**	.16***	-.13
Au	-9.4	-4.77	1.71**	-.718	.019	.033
PT	-14.73	-4.694	-.7	.078	-.134***	.017
Int	54.22	-31.12	8.11	8.1***	-1.38	8.026***
Age	-.318	.05	.023	-.005*	-.00087	-.0002
Ev	80.179	5.2	6.62	3.53***	.07	-.428
Cv	.104	27.57	-.04	-6.444***	.006	-1.78**
Lo	14.84	-38.71***	1.522	.132	.143**	.09
Size 1	8.48	-3.737	-.82	-.825***	-1.04***	-.957***
Size 2	-6.83	5.283	1.08*	.936***	1.029***	.962***
Gr	18.16	.955	-.43	.016	.047	-.02
R ² model	.0028	.0287	.009	.552	.705	.864
p-value	.634	.01	.087	<.0001	<.001	<.001
BIC	5003.248	1176.177	2791.282	257.5791	376.2622	158.002
MSPE	10325.69	838.52	44.1388	.5315	.1131	.1063

*** Coefficients are significant at the level of 1%

** Coefficients are significant at the level of 5%

* Coefficients are significant at the level of 10%

According to Table 5, the p-value value of the models, all models except the regression model of earnings persistence on pe in the Iranian environment are significant. To compare the models in each environment, BIC and MSPE statistics were used. The lower their value, the better and more appropriate the model. Among the models in the New Zealand environment, the model related to the effect of earnings persistence on Tobin's Q has less BIC (158.002) and less MSPE (.1063). For Iranian companies, the model related to the effect of earnings persistence on Q Tobin has less BIC (376.2622) and MSPE (.1131). So, according to the results obtained from both environments, it is more appropriate and better than other models. Likewise, the coefficient of determination of the PE model is low and in the New Zealand environment, it is less than 10%, which shows that the earnings quality determinants and earnings persistence have a small role



in explaining the variability of firm value (PE). Similarly, earnings persistence in none of the models had a significant relationship with PE. The coefficient of determination of the pb model was nearly appropriate only in the New Zealand environment, and 55.2% of the variability of firm value (pb) was explained by the determinants of earnings quality and earnings persistence. The highest coefficient of determination in the two environments is related to the Tobin's Q model, which is above 60%. Among all the models related to the effect of earnings persistence on firm value, only earnings persistence had a positive and significant relationship with the Tobin's Q ratio in Iran, so that this result is consistent with the results of Gaio and Raposo (2011) in this regard. In their study, they found a positive and significant relationship between firm value and accumulated measure of earnings quality (consisting of seven earnings quality criteria), and the proxy they used for firm value was the Tobin's Q ratio. It is also expected that companies with higher earnings quality have higher capital market valuations. According to the results obtained in this section, among the criteria considered for the value of the company, the criterion of Tobin's Q ratio compared to pe and pb is a better criterion to explain the economic consequence of earnings quality. Based on the obtained results, the second research hypothesis on the significant relationship between earnings persistence and firm value is accepted only in the Tobin's Q ratio in the Iranian environment and the case of other value criteria of the firm, i. e., pe, and pb, it is rejected. According to Table 5, the results of the economic impact of earnings quality are different in Iran and New Zealand companies, so that the earnings persistence has a positive and significant effect on Q Tobin ratio in Iran, but does not have a significant effect on New Zealand's environment. Therefore, the third research hypothesis is accepted.

Conclusion

The importance of the effect of information quality on the capital market has been the center of interest of a considerable number of research studies.

The release of high-quality financial information by companies and the existence of a strong corporate governance system will decrease the conflict of interest between managers and owners. This research project intended to investigate the market's response to the quality of financial information in the two environments of Iran as a developing country and New Zealand as a developed country. In the first step, the market reaction has been measured by the industry-adjusted PE and then analyzing the sensitivity of the results implementing two variables including industry-adjusted PB and Tobin's Q ratio. In the second step, the quality of financial information is measured by the sustainability of the earnings. And then, the determinants of earnings quality have been broadly inspected at four levels: firm characteristics, business characteristics, economic characteristics, and audit quality. at last, the relationship between determinants of earnings quality and earnings persistence has investigated by recruiting the exploratory method. The findings showed that this model was not significant in the Iranian environment, but in the New Zealand environment was significant. Among the determinants of earnings quality, leverage, intangible intensity and the variability of operating cash flow had a significant relationship with earnings sustainability. The leverage had a direct relationship with earnings quality. The variability of operating cash flow had a negative and significant relationship with earnings sustainability, which is consistent with the results of Ahrens (2010) in this field, but not consistent with the results of Francis and et al. (2004) in this field. Based on the results, the intangible intensity had a positive and significant relationship with earnings



sustainability, which is not related to the results of Francis et al. (2004) and Ahrens (2010) in this field. As can be seen, the impact of determinants of earnings quality varies in different environments, and a fixed theory cannot be put forward. The average earnings persistence of New Zealand companies (.258) is higher than that of Iranian companies (.201), so that the sustainability of earnings in both countries is low, while it was expected that New Zealand, as a developed country, will have high earnings sustainability. Internationally, earnings sustainability in developing countries is lower than in developed countries, so that, the sustainability of earnings for Egyptian companies by Ebid (2010) is lower than the sustainability of earnings obtained by Sloan (1996) for American companies. Among all the models related to the effect of earnings sustainability on firm value, only earnings sustainability had a positive and significant relationship with the Tobins' Q ratio in the Iran environment. This result is consistent with the results of Gaio and Raposo (2011) in this regard. Among the models in the New Zealand environment, the model related to the effect of earnings sustainability on Tobins' Q has less BIC (158.002) and less MSPE (.1063). In Iran, the model related to the effect of earnings sustainability on Tobins' Q has less BIC (376.2622) and MSPE (.1131). Likewise, the highest determination coefficient in the two environments is related to the Tobins' Q model, which is above 60%. Consequently, according to the results obtained from both environments, the model related to Tobins' Q is more appropriate and better than other models.

The results of the study suggested that it is better to expand the research scope in future research and to compare and investigate the quality of earnings at including more countries. In the line with the economic consequences of earnings quality, the findings of this study indicated that earnings sustainability is not significantly related to PE and PB ratios, so it is recommended that in the future research, other economic outcomes measure of earnings quality, such as capital cost, the extent of the price of buying and selling, distribution in analysts' earnings forecasts, the number of analysts following the company, the market value of equity, analysts' predictions and the company's value be used. In the current study, macroeconomic indicators such as inflation and exchange rate are not considered as determinants of earnings quality, so it is suggested that these factors be considered in future research.

Like other studies, the current research project has suffered from some limitations, so that some companies were removed due to lack of necessary information and led to a small sample size.

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