Impact of New Technology on Market Value Price and Value Relevance of Accounting Information in the Tehran Stock Exchange

Abdol Hossein Talebi Najaf Abadi[1], Mostafa Zangi Abadi[2], Narjes Kamali Kermani[3], Shiva Safarian[4], Mohammad Kaveh Nobandegani[5], Roholah Talebi Najaf Abadi[6], morteza adlzadeh[7], Farshad mohammad pour[8]

[1]Accounting Ph.D student, Tehran Allame Tabatabaee University
[2,8]Auditing M.A student, Allame Tabatabaee University of Tehran
[3]The member of scientific group of Bojnoord University Accounting department
[4,5]MBA candidate Management Department of University of Economic Science Tehran
[6]Student of master course of Accounting of the University of Mazandaran
[7]Student of master course of Accounting of Allame Tabatabaee University of Tehran

ABSTRACT

Purpose – The main purpose of this study is to find out if there is any relationship between accounting information and company value and how accounting information affects value relevance. According to the progresses in all fields because of new technology, this study examined the influences of new information technology adoption on value relevance of accounting information. The assumptions of this study are supported by evidences from Tehran Stock Exchange.

Design/methodology/approach – This study is correlative in approach and based on empirical and documentary analyses. The study also extended the international literature in market based accounting research by examining empirical evidence on relationships between company value and two accounting variables Earnings per share and Return on equity of 40 important firms listed on Tehran Stock Exchange.

Findings – This study investigated the relationship between accounting information and value relevance of the company value. The results of this survey confirmed there is a relationship between these factors and characterized this relationship.

Research limitation/implication – This research surveyed the data banks of 40 companies of Tehran Stock Exchange from 2002 to 2004, so for more accurate results, surveying more companies is suggested.

Originality/value – Because of significant developments in information technology, which have increased the rate of data processes with a great accuracy, information technology also has great influences on accounting. So this study surveyed the impact new information technology on accounting information value relevance. The data for this study is from 40 important companies of TSE and it was for the first time in Iran in its way.

KEY WORDS: information technology, value relevance, returns on equity, earnings per share, company value, regression model

Paper type research paper

INTRODUCTION

Nowadays for most of investors using financial statements is the main reason for their decision making. So this information should have some characteristics such as value relevance. Regard to the technological advancements, the need for using new technologies in financial reporting is obvious. So the companies should present financial statements to their stakeholders via internet networks not to be removed from this competition.

Also because of significant advancements in new information technology field, data processing rate and information storage turned to be faster, cheaper, and easier with higher accuracy then information are more available than before. Therefore accounting has to be modified like other fields, and provide information for users faster and cheaper and try to achieve real time reporting.

This study investigates the relationship between stock price and accounting information, and also survey the impact of new technologies on accounting information value relevance. In other word, through analyzing elements such as accounting information, stock price (company value), and effect of information technology on them, this study is going to find out if information technology could provide a value relevance accounting information system.

This research is going to find out if there is any relationship between accounting information and company value and how accounting information affects company value relevance. Also this paper surveyed the impact of new technology adoption on value relevance of accounting information in the Tehran Stock Exchange (TSE).

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[*]**Corresponding Author:** Abdol Hossein Talebi Najaf Abadi, Accounting Ph.D student, Tehran Allame Tabatabaee University. Hossein.taleby@gmail.com

The model which is used in this research is the regression model established on ideas of Ohlson (1995) and Edwards and Bell (1961). The results of this study, surveyed data of 40 companies from 2002 to 2005, show that there is a positive relationship between accounting information and company value and information technology has a positive impact on value relevance of accounting information. [18]

The concept of value relevance can be defined in a few ways. This study is based on definitions from Francis and Schipper (1999). They discussed four different interpretations of value relevance. Based on their definitions, the value relevance is defined as the ability of information in financial statements to capture and/or summaries information that determines value of firms. [12]

Therefore, value relevance is measured as the degree of statistical relationship between information included in accounting statements and market value or returns. Value relevance can be measured in short term event studies comparable to the one performed by Ball and Brown (1968) or long term association studies. This study focuses on value relevance on long term annual observations of 40 companies at TSE in a four years period from 2002 to 2005. In this period the impact of new technology can be seen because the SIDSCO.ir (a website for releasing information of TSE) began to work in 2004. [5]

Although TSE started to work in 1967, technological advancements were slow until the 94th act of the Third Development Plan (2000-2004) obligated exchange stock council to prepare capital market internet network to do electronics trades in a national level and cover the financial reporting in both national and international levels. With this facility, all investors could access to financial statements of each company through the new website. Therefore, this study is going to examine how the new technology adoption at TSE has changed the value relevance of accounting information.

Iran Stock Exchange

Following economical and societal evolution in 1960's, Iran's economy started to move toward an economy which is based on market. Increment of industrial activities in that period, which needed markets and new tools for financing them, put the creation of a stock exchange in the agenda. In 1966 the law for establishing it was approved in the parliament. Then the TSE based on free market established, the purpose was to encourage the private sector. And at February 1967 officially started its activity by acceptance of shares of a bank, Pars petroleum corporation, governmental bonds, treasury documents and Abas Abad bonds. [22]

LITERATURE REVIEW

Etemadi et al (2006) in a study which was about the impact of information technology on qualitative characteristics of accounting information, surveyed theoretical range of logical network of information technology effect on each of qualitative characteristics of accounting information. The results of this survey showed that information technology improves the value relevance of accounting information and decreases its reliability and also slightly increases comparability. [1]

The term market based accounting research has been used by several authors, most of the early empirical studies in this field focus on earnings and are usually concerned with response coefficient that relates earnings to returns and prices. Lev (1989) found out earnings generally have very low explanatory power, and suggested that the practical value of reported earnings is in doubt. He found out explanatory power measured by R^2 is often below 10% and it approaches zero in some cases. [16]

Frankel and Lee (1998) explored relationships between share prices and accounting variables using data from 20 countries including US, Australia, South Korea, and Japan. They used reported earnings, reported book value and earnings forecasts to estimate the value relevance of accounting information. Their dependent variable is share prices. The explanatory power of the model is high, 88% for US and 72% for other countries combined. [13]

King and Langli (1998) examined relationships between share prices and the two main accounting variables with data from Germany, Norway and the UK. They selected these countries because the accounting systems are considered quite different, particularly in their degree of conservatism. The authors estimate a model that links share prices to equity book value and current earnings, and also estimate two restricted models that express share prices as a function of either equity book value or earnings alone. They found out book value and earnings are both significantly related to share prices in all three countries, and that the two variables combined have explanatory power of about 70 per cent in the UK, 60 per cent in Norway and 40 per cent in Germany. The authors concluded that these findings are consistent with the differences in the accounting systems of these countries. They also found out the incremental and relative explanatory power of the two variables differ over time and between countries, with book value explaining more than earnings in Germany and Norway but less than earnings in the UK. Finally, results with an extended model that includes realized earnings for the following four years as proxies for expected earnings

show that these additional variables explain little of the variation in market prices not already explained by current book value and earnings. [7]

In another study of international accounting differences, Graham and King (2000) surveyed relationships between share prices and accounting variables in Indonesia, South Korea, Malaysia, the Philippines, Taiwan and Thailand. Their regression model relates share prices to current book value and current residual income and they found out the coefficients on both these variables are statistically significant in all six countries. They also found out the explanatory power of the model varies significantly between countries, ranging from 24 percent in Taiwan to 55 percent in Thailand and 90 percent in the Philippines although, in this case, the sample size is relatively small. They also found out the incremental explanatory power of book value is higher than that of residual earnings in all six countries. [23]

Oyerinde (2009) surveyed the value relevance of accounting data in the Nigerian Stock Market. He considered average price per share as dependent variable with earnings per share, earnings yield and returns on equity as independent variables. The sample includes up to 30 companies from 2001 to 2004 in Nigerian Stock Market. He found out the relationship between share price and earnings per share is high but the return on equity is very low. However, combined model of all the variables reflected very high level of explanatory power value of more than 95% each year. [19]

Collins, Maydew and Weiss (1997) investigated changes in value relevance of earnings and book values of equity over 40 years. R^2 is used as the primary metric of value relevance. They found out the incremental value relevance of earnings has declined over the last 40 years. This view is confirmed by the Francis and Schipper (1999). They also reported that value relevance has declined for earnings getting R^2 value 27% in 1952 to 16% in 1994. [12]

Lev and Zarowin (1999) suggested that the value relevance of book value, earnings and cash flows have decreased over the past 20 years. They further reported that value relevance decline more pronounced for cash flows than earnings. The reason for the value relevance decline is the rate of change. [17]

Theoretical bases

Quality characteristics of accounting information

To achieve the purpose of principles of accounting the information which is provided by financial reporting with specific characteristics is needed. Although these characteristics are greatly affected by economical, societal, political, cultural, and legal circumstances but the information which is provided for decision making of users about a profit unit should relatively be reliable and correct.

Graph 1: Qualitative characteristics of accounting information [3]
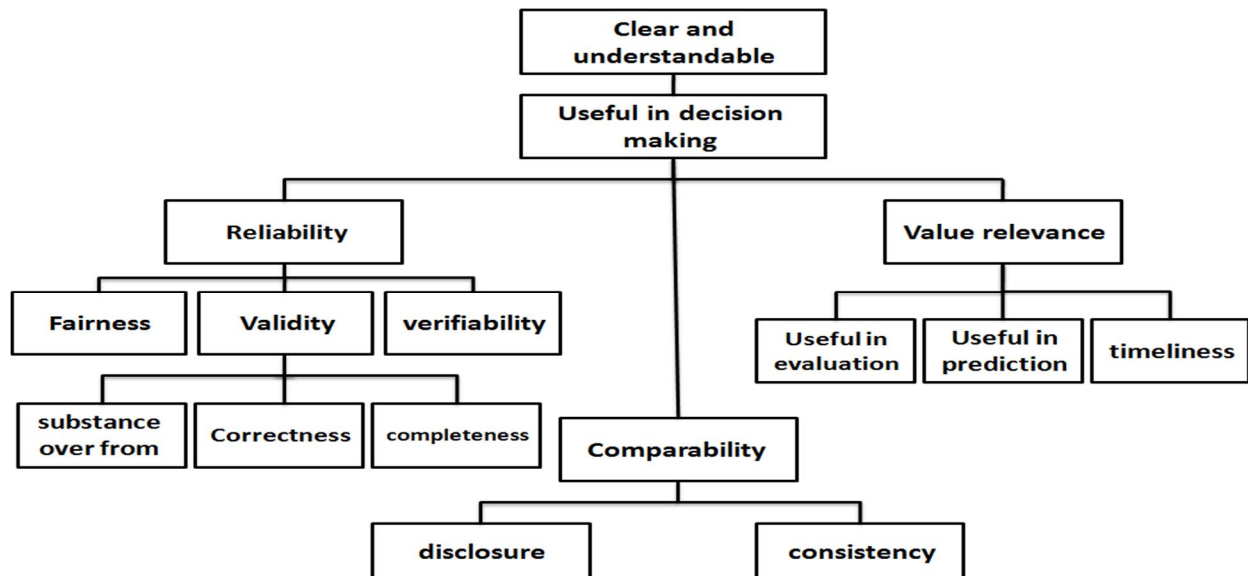
One of the qualitative characteristics which is considered in this study is value relevance. Value relevant information is a kind of information which can approve, adjust or deny the evaluations which are done by the users

about results of previous and current events or their expectation of future events of a profit unit. This capability let us affect the decisions of users to do something or avoid doing something. Value relevance is a relative concept and greatly affected by information needs of various groups of users and type of their decisions.

As it was demonstrated in graph 1, the value relevant information is timely (users could access financial information when they still had enough time for decision making), useful in prediction (financial information should be useful for a user to predict the results of current and future events of a profit unit), and useful in evaluations (financial information should approve or adjust previous expectation in compare to the results of previous activities and ultimately assist users to modify their affaires). [3]

Different perspective on value relevance

Francis and Schipper (1999) defined value relevance from four perspectives:

I.   Fundamental analysis view of value relevance—intrinsic value of the firm is measured without referring to market value. According to this approach value relevance focuses on the usefulness of accounting information in equity valuation;

II.   The predictive view of value relevance—the accounting information is relevant if it can be used to predict future earnings, dividends, or future cash flows;

III. The information view of value relevance—where the value relevance of accounting information is measured in terms of market reactions to new information;

IV.   The measurement view of value relevance—the financial statement is measured by its ability to capture or summarize information that affects equity value. Both price and returns can be used for value relevance under measurement view approach. [12]

Accounting information

Earnings per share represents the share of each of the original owners (common shareholders) from the periodical performances of the company which is come from dividing net profit to weighted average common shares.

Return on equity is an accounting return rate which measures the rate of return on the ownership interest (shareholders' equity) of the common stock owners. ROE is equal to a fiscal year's net income (after preferred stock dividends but before common stock dividends) divided by total equity (excluding preferred shares), expressed as a percentage.

Assumptions

- Accounting information is in relation with company value
- The changes in accounting information affect the value relevance of company value
- Information technology affect the value relevance of accounting information

Graph 2: conceptual model of the study
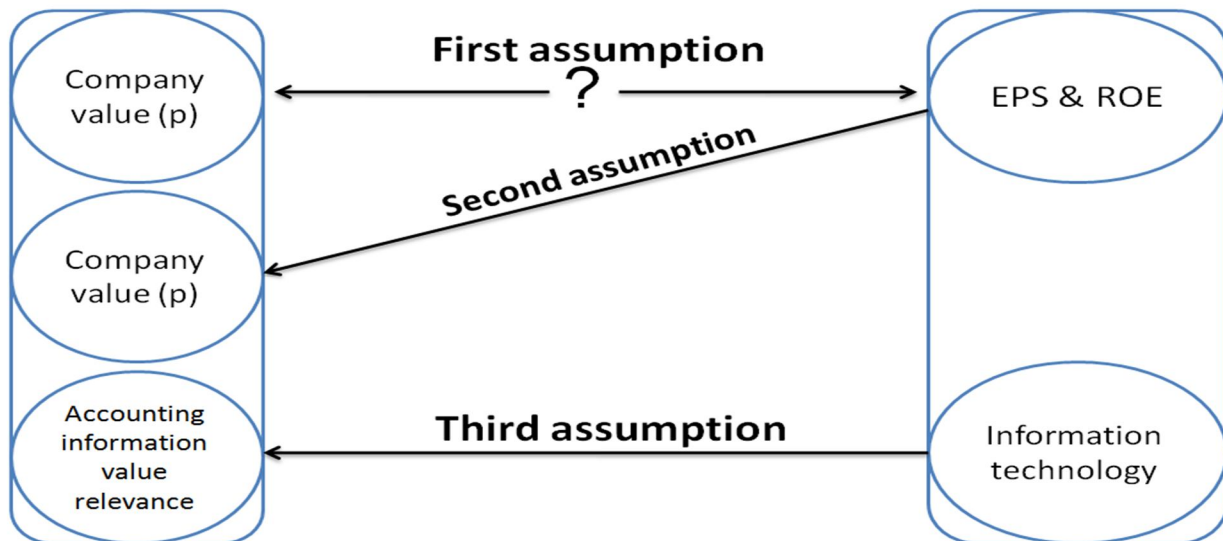
Population of this study and sample selection

Companies listed on the TSE are statistical population of this study. These industries include mass construction, automotive and parts manufacturing, cement, stucco, sugar, and metallic minerals in the period of 2002 to 2005. The companies of this study were selected by these conditions:

1) Should be listed on TSE from 2002 to 2005;
2) Should be at work in this period;
3) The company's financial statements of this period should be available.

These industries were selected randomly from the substantial qualified industries of TSE. The companies which have these conditions are qualified. Data were obtained from financial statements and explanation notes which are available in www.RDIS.ir and www.TSETMC.com web sites and Rahavard Novin software.

Research models

The model which is used for determining the relationship between market value of equity and accounting information for examining the assumptions is as follow:

$$MVE = f(AI) \tag{1}$$

Where:
MVE = market value of equity;
AI = accounting information.

Established on ideas of Ohlson (1995) and Edwards and Bell (1961), a model is adopted which used market price per share (P) as the dependent variable and earnings and return on equity as independent variables. [11, 18]

$$P_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 ROE_{i\,t} + \varepsilon \tag{2}$$

Where:
EPS = earnings per share;
ROE = return on equity;
P_{it} = price per share.

Also for examining the relationship between price per share and other variables in isolation, the following regression models are used:

$$P_{it} = \beta_0 + \beta_1 EPS_{it} + \varepsilon \tag{3}$$

This model is used for surveying the relationship between price per share and earnings per share.

$$P_{it} = \beta_0 + \beta_1 ROE_{i\,t} + \varepsilon \tag{4}$$

And this model is used for surveying the relationship between price per share and return on equity.
Coefficient of determination (R^2) is used for evaluating the explanatory power of models 2, 3 and 4. The period of study for this paper is 2002 to 2005. While the first two years are before the adoption of new information technology and the second two years are after information technology adoption. Then the average incremental value of R^2 after new technology adoption (R^2_{incre}) can be defined as:

$$R^2_{incre} = R^2_2 - R^2_1$$

Where:
$R^2_2 = \frac{R^2_{2004} + R^2_{2005}}{2}$,
$R^2_1 = \frac{R^2_{2002} + R^2_{2003}}{2}$.

Assumptions examination

Regarding to obtained information from www.RDIS.ir website and Rahavard Novin software, the companies qualified for this study are as bellow:

Table 1: selected companies for this study

Sector	Frequency	Frequency percentage
Mass construction	3	7.5
Automotive and parts manufacturing	16	40
Cement	11	27.5
Sugar	8	20
Metallic minerals	2	0.5
Total	**40**	**100**

Results of first assumption

Regarding to table 2, the correlation coefficient between company value (price per share) and earnings per share and return on equity (accounting information) are 0.317 and 0.342 when significant level is 0.000, which shows that there is a positive and significant relationship between two variables with a 99% confidence level. Therefore the first assumption which claimed there is a relationship between accounting information and company value is verified.

Table 2: the results of first assumption

	EPS,P	ROE,P
Correlation	0.317	0.342
Significant level	0.000	0.000

The results of second assumption

Regarding to the table 3, the F value of the model is equal to 17.690 and the significant level is 0.000 which show that the regression model is significant with a 95% of confident level. Also the coefficient of determination in this model is equal to 0.101 which shows that about 10% of changes of dependent variable (price per share) are describable by independent variable. And the probability of the H_0 based on no relationship between earnings per share and dependable variable (H_0: β_1=0) is equal to 0.000 which is less than 0.05, so there is a significant relationship between these variables in a 95% confidence level.

Table 3: the results of second assumption examination of model 1

R^2	Adjusted R^2	β	P	F	Significant level
0.101	0.95	4.419	0.000	17.690	0.000

Regarding to table 4, the F value of model is equal to 20.991 and significant level is 0.000 which show that regression model, statistically significant in a 95% confidence level. Also the coefficient of determination of model is equal to 0.117 which shows that about 12% of changes of dependant variable (price per share) are describable by independent variable. And the probability of the H_0 based on no relationship between return on equity and dependable variable (H_0: β_1=0) is equal to 0.000 which is less than 0.05, so there is a significant relationship between these variables in a 95% confidence level.

Table 4: the results of second assumption examination of model 2

R^2	Adjusted R^2	β	P	F	Significant level
0.117	0.112	114.869	0.000	20.991	0.000

Regarding to table 5, the F value of model is equal to 11.056 and significant level is 0.000 which shows that regression model, statistically significant in a 95% confidence level. Also the coefficient of determination of model is equal to 0.123 which shows that about 12% of changes in dependant variable (price per share) are describable by independent variable. And the probability of the H_0 based on no relationship among earnings per share and return on equity and dependable variable (H_0: β_1, β_2=0) is equal to 0.249 and 0.045 which shows that in a 95% confidence level, the influence of earnings per share is less than return on equity in this model.

Table 5: the results of second assumption examination of model 3

R^2	Adjusted R^2	β	P	F	Significant level
0.123	0.112	81550	0.045	11.056	0.000
		1.764	0.294		

Ultimately, the results of the study show that the accounting information (earnings per share and return on equity) affect the company value (price per share).

The results of the third assumption

Regarding to the obtained coefficients of determination of the models 1, 2, and 3 in years 2002, 2003, 2004, and 2005, you can see the differences of determination coefficient's average for years 2002 and 2003 as the years before new technology adoption and the determination coefficient's average for years 2004 and 2005 as the years after new technology adoption are in the seventh column of the table 6. The obtained differences are positive which shows that the new information technology affect the value relevance of the information.

Table 6: the results of third assumption examination

Model		R^2_{2002}	R^2_{2003}	R^2_1	R^2_{2004}	R^2_{2005}	R^2_2	$R^2_2 - R^2_1$
EPS	(1)	0.031	0.139	0.085	0.102	0.097	0.100	0.015
ROE	(2)	0.061	0.129	0.095	0.166	0.072	0.199	0.024
EPS + ROE	(3)	0.062	0.150	0.106	0.166	0.101	0.134	0.028

THE RESULTS

This study investigated the relationship between accounting information and value relevance of the company value, and the impact of information technology on value relevance of the accounting information in the period of 2002 to 2005 for 40 companies listed on Tehran Stock Exchange. The results of this study demonstrate there is a relationship between accounting information and company value. Also the results of the third assumption show that the information technology affects the value relevance of the accounting information. These results confirmed the results of the research of Pathirawasam and Wickremasinghe (2011).

Suggestions

In this research the data of 5 industries were investigated, therefore it is suggested for future research to investigate this issue in other industries too.

This study investigate a period since 2002 to 2005, it is suggested to investigate other periods.

In this study we surveyed the impact of information technology on value relevance of accounting information, so it is suggested to survey its impact on other qualitative characteristics.

REFERENCES

1–Etemadi, H & Hassan Aghaei, K & Elahi, S 2006, Investigating the impact of information technology on qualitative characteristics of accounting information, The Iranian Accounting And Auditing Review, no. 43, pp. 3-24.

2–Azar, A & Momeni, M 2011, Statistics and applications in management, vol. 2, SAMT publication, Iran.

3–Accounting standard board of Iran 2011, Theoretical basis of accounting and financial reporting in Iran, vol. 7, no. 113.

4–Pathairawasam, C & Wickremasinghe, G 2011, Impact of Information Technology Adoption on Value Relevance of Accounting Information: Evidence From the Colombo Stock Exchange, Journal of Modern Accounting and Auditing, ISSN 1548-6583, vol. 7, no. 7, 680-688

5- Ball, R & Brown, P 1968, An empirical evaluation of accounting income numbers, Journal of Accounting Research, vol. 6, no. 2, pp. 159-178.

6 - Banz, R & Breen, W 1986, Sample dependent results using accounting and marketing data: Some evidence, Journal of Finance, no. 41, pp. 779-793.

7–Bao, B.H & Chow, L 1999, The usefulness of earnings and book values for equity valuation in emerging capital market: Evidence from listed companies in the People's Republic of China, Journal of International Financial Management and Accounting, no. 10, pp. 85-104.

8–Basu, S 1997, The conservatism principle and the asymmetric timeliness of earnings, Journal of Accounting & Economics, vol. 24, no. 1, pp. 3-27.

9–Brown, S & Kin, L & Lys, T 1999, Use of R^2 in accounting research: Measuring changes in value relevance over the last four decades, Journal of Accounting & Economics, vol. 28, no. 2, pp. 83-115.

10–Collins, D.W & Maydew, E.L & Weiss, I.S 1997, Changes in the value relevance of earnings and book values over the past forty years, Journal of Accounting & Economics, vol. 21, no. 1, pp. 143-181.

11–Edwards, O.E & Bell, P.W 1961, The theory and measurement of business income, Berkeley and Los Angeles: University of California Press.

12–Francis, J & Schipper, K 1999, Have financial statements lost their relevance? Journal of Accounting Research, vol. 37, no. 2, pp. 319-352.

13–Frankel, R & Lee, C.M.C 1998, Accounting diversity and international valuation, Retrieved from SSRN : http://ssrn.com/abstract=2658.

14–Hayn, C 1995, The information content of losses, Journal of Accounting & Economics, vol. 20, no. 2, pp. 125-153.

15–King, R.D & Langli, J.C 1998, Accounting diversity and firm valuation, International Journal of Accounting, vol. 33, no. 4, pp. 529-567.

16–Lev, B 1989, On the usefulness of earnings and earnings research: Lessons and directions from two decades of empirical research, Journal of Accounting Research, vol. 27, no.3, pp. 153-192.

17–Lev, B & Zarowin, P 1999, The boundaries of financial reporting and how to extend them, Journal of Accounting Research , vol. 32, no. 2, pp. 353-385.

18–Ohlson, A.J 1995, Earnings, book values and dividends in security valuation, Contemporary Accounting Research, no. 1, pp. 1661-1688

19–Oyerinde, D.T 2009, Value relevance of accounting information in emerging stock market in Nigeria, Proceedings from: The 10th Annual International Conference of International Academy of African Business and Development (IAABD), Uganda: ISBN 0-9765288-4-3.

20–Penman, S.H & Zhang, X.J 2002, Accounting conservatism, the quality of earnings, and stock returns, Accounting Review, vol. 77, no. 2, pp. 237-264.

21–Perera, R.A.A & Thrikawala, S.S 2010, An empirical study of the relevance of accounting information on investor's decisions, Proceedings from: The International Research Conference on Business & Information, Sri Lanka: ISBN978-955-8044-91-8.

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23–Graham, R.C. & King, R.D. 2000, Accounting practices and the market valuation of accounting numbers: evidence from Indonesia, Korea, Malaysia, the Philippines, Taiwan and Thailand, The International Journal of Accounting, vol. 35, no. 4, pp. 445-70.