Value relevance of accounting information: evidence from South Eastern European countries

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In this article the authors analysed value relevance of accounting information based on a sample of 97 corporations listed on one of the following capital markets: Ljubljana Stock Exchange, Zagreb Stock Exchange, Sarajevo Stock Exchange, Banja Luka Stock Exchange and Belgrade Stock Exchange. Research results show that accounting information is value relevant on all the observed markets. Value relevance analysis for the period 2005–2010 has shown that there was no increase in the explanatory power of accounting variables, but just the opposite. Research results indicate decreases or large oscillations in the value relevance for the observed period.

Keywords: accounting information; value relevance; South East European (SEE) capital markets

JEL classification: G10, G14, G15, M41

1. Introduction

Value relevance studies represent simultaneous testing of the relevance and reliability of accounting information and are one of the most productive areas of accounting research in the last 20 years. Empirical researches from the accounting area conducted in developed countries (for example: Ali and Hwang (2000), Arce and Mora (2002), Black and White (2003), Collins, Maydew, and Weiss (1997), Gjerde, Knivsfla, and Saettem (2010), Hung (2001), King and Langli (1998) show that accounting information (first of all earnings and book value) are significant factors in evaluation of corporations and that these variables are significantly related to share prices. In other words, studies show that accounting information is value relevant. Accounting information is considered value relevant if it is correlated with market value of a company. If there is no statistically significant relation between accounting information and market value of a company it can be concluded that accounting information is not value relevant which implies that financial statements do not meet one of the fundamental objectives of financial reporting.

Despite quite extensive literature and numerous published articles in the area of value relevance it is important to notice that the majority of studies were conducted on large and developed capital markets and that there are very few studies conducted on small, developing capital markets. Considering the fact that value relevance studies were not performed on the capital markets of the countries of South East Europe (SEE) it is reasonable to ask the following questions:

- Is there a relation between share prices and accounting variables which was observed and scientifically confirmed on developed capital markets?
- Is there an increase in the value relevance of accounting information during the time?

When analysing the changes in the value relevance the authors assume that on all the observed capital markets value relevance might be increased due to the development of capital markets and improvement of regulatory frameworks and financial accounting standards. In this article the authors also analyse changes that occurred in the value relevance on the observed markets in the period 2005–2010.

The article is organised as follows. After the introduction the authors summarise the main studies from the value relevance area. In the third section the authors present research samples, hypotheses and methodology. This is followed by research results and the last part of the article includes the main conclusions.

2.   Literature review

2.1.   *Cross-country value relevance studies*

A large number of cross-country value relevance studies that were conducted in the last 20 years have origins in different corporate governance systems. More precisely, the authors consider that differences in corporate governance systems cause differences in the value relevance of accounting information. As examples of studies where differences in the value relevance are attributed to different institutional and legal frameworks it is possible, among others, to point out studies conducted by Ali and Hwang (2000), Ball, Kothari, and Robin (2000) and Black and White (2003). Ali and Hwang (2000) compared the value relevance of accounting information for 16 countries in the period 1986–1995 in order to determine differences in the value relevance between countries that belong to continental or to Anglo-Saxon model of corporate governance. Research results have shown that the value relevance of accounting information is lower in countries that belong to continental corporate governance system and which are characterised by a strong bank orientation in raising external capital. Influence of differences in corporate governance systems on the quality of accounting earnings was analysed by Ball et al. (2000). The authors conducted research on four countries that belong to Anglo-Saxon corporate governance model (Australia, Canada, the US and UK) and on three countries that belong to continental corporate governance model (France, Germany and Japan). Finally the sample consisted of more than 40,000 observations for the period 1985–1995. The authors analysed two important characteristics of accounting earnings (conservatism and timeliness) and research results have shown that timeliness is higher in countries that belong to an Anglo-Saxon corporate governance model. Black and White (2003) compared the value relevance of book value and earnings in Germany, Japan and the US. Research results show that the value relevance of book value is higher than the value relevance of earnings in Germany while the results are less robust for Japanese companies. More precisely, for Japan the sample book value is more value relevant than earnings only in the case of companies that reported negative earnings. Results also show that value relevance of earnings is higher than value relevance of book value for the sample of American companies.

The second stream of research in the area of cross-country value relevance studies is based on comparing the value relevance of accounting information prepared according

to different accounting standards. Examples of such studies following studies can be pointed out: Garcia-Ayuso, Monterrey, and Pineda (1998), King and Langli (1998) and Arce and Mora (2002). A comparative value relevance study on the capital markets of the European Union, Japan and the US was performed by Garcia-Ayuso et al. (1998). The results of their research indicated significant differences in the value relevance of accounting information among countries which are caused by differences in institutional (cultural, macroeconomic, political or regulatory) factors. King and Langli (1998) conducted a comparative value relevance analysis on the capital markets of Germany, Norway and the UK. The results have shown that accounting information is value relevant for all three markets. The results have also shown that accounting information is the least related to share prices in Germany (R^2 amounts 40%), the best relation to share prices was evidenced for the UK capital market (R^2 amounts 70%) and the explanatory power of the accounting variables in Norway was 60%. Arce and Mora (2002) performed a research on a sample of corporations from eight European countries. Research results have shown that it cannot be concluded that accounting information is more value relevant in market-orientated systems than in bank-orientated systems although it is noted that book value and earnings have different roles in the valuation of a company.

2.2. Cross-time value relevance studies

As a separate stream of value relevance studies, cross-time value relevance studies can be pointed out. Examples of these studies include Collins et al. (1997) and Devalle, Onali, and Magarini (2010). However, it is important to emphasise that the results of their studies are conflicting and there is no uniform conclusion as to whether the value relevance of accounting information has increased or decreased over time. Collins et al. (1997) analyse the relationship between earnings and book value at a sample of US companies for the period 1953–1993. The results of the research indicated that the total explanatory power of earnings and book value did not decrease in the observed period, but just the opposite – a slight increase was noticed. Total explanatory power amounted 54%, meaning that earnings and book value explained about 54% variation of the stock prices for the observed period. Devalle et al. (2010) analysed whether the value relevance of accounting information has increased after implementing International Financial Reporting Standards (IFRS) as mandatory for preparation of consolidated financial statements. Research results have shown that influence of earnings on share prices has increased after IFRS implementation in the cases of Germany, France and the UK while the impact of book value had decreased in all the analysed countries except the UK.

3. Research structure

3.1. Sample

The analysis of the value relevance of accounting information was conducted on the capital markets of following SEE countries: Croatia, Slovenia, Serbia and Bosnia and Herzegovina (Republika Srpska and Federation of B&H). The research was conducted on selected companies whose shares are listed in the capital markets of the selected countries, and in order to achieve better analysis of accounting information value relevance analysis was limited only to those companies that were actively trading during 2005. Companies were selected for the study according to a simple

criterion – share turnover for the year 2005. By a subjective decision of the authors of this article research was performed only on those companies whose share in total market turnover during 2005 was a minimum of 0.5%. The authors included in the research only companies that achieved the above mentioned criteria for the year 2005 but it is important to notice that in accordance with previous research in this area, for example Arce and Mora (2002) and Callao, Cuellar, and Jarne (2006), and in order to increase the sample homogeneity and comparability of results among countries, financial institutions were excluded from the analysis since those institutions are characterised by certain specificities related to preparation and publication of financial reports. Responding to these criteria 97 companies were selected for the study. The number of companies for each of the analysed markets is shown in Table 1.

Companies selected for the study in year 2005 were analysed for the whole research period (2005–2010), and data are collected from the stock markets' web pages and from the web pages of companies included in the analysis.

3.2. Hypotheses and research methodology

Based on recent theoretical insights in the area of the value relevance of accounting information, and in order to obtain answers to the question whether there is a correlation between accounting information and share prices the first research hypothesis was set.

Hypothesis 1: *Accounting information published in the company's financial reports (book value and earnings) represent important factors that influence stock price movements on the capital markets of selected transition countries.*

This hypothesis is focused on analysis of relationship between share prices and accounting information on selected capital markets. In order to test the first research hypothesis share market value is expressed as function of earnings and book value and to test the hypothesis methodology based on the previous work of Ohlson (1991) and Feltham and Ohlson (1995) is used:

$$P_{it} = a_0 + a_1 E_{i,t} + a_2 BV_{i,t} + e_{i,t} \tag{1}$$

where:

P_{it} – share price at the end of fiscal year t,
E_{it} – earnings per share in year t,
BV_{it} – book value per share at the end of year t,
e_{it} – other value relevant information in year t.

Based on this model the correlation between share prices and accounting variables is determined. If observed variables, i.e. earnings and book value explain share prices than it

Table 1.   The research sample by markets.

Market	Ljubljana Stock Exchange	Zagreb Stock Exchange	Sarajevo Stock Exchange	Banja Luka Stock Exchange	Belgrade Stock Exchange	Total
Number of observations	16	28	19	18	16	**97**

Source: Authors calculation.

is expected that regression coefficients on these variables should be positive and significant. Explanatory power of the accounting variables is analysed through the determination coefficient of the estimated regression model. From the first research hypothesis three supporting hypotheses are derived:

Hypothesis 1.1: *There is an empirically verifiable relationship between share prices and share book values.*

Hypothesis 1.2: *There is an empirically verifiable relationship between share prices and earnings presented in the profit and loss account.*

Namely, based on model 1 it is possible to define total explanatory power of earnings and book value and in order to analyse the differences between value relevance of earnings and book value following models are used:

$$P_{it} = c_0 + c_1 BV_{i,t} + \varepsilon''_{i,t} \tag{2}$$

$$P_{it} = b_0 + b_1 E \cdot i, t + \varepsilon''_{i,t} \tag{3}$$

Analysing the first two supporting hypotheses will result in regression and determination coefficients and these coefficients are the basis for testing the third supporting hypothesis (Hypothesis 1.3.). More precisely, based on these coefficients, differences in the value relevance of earnings and book value will be tested and the third supporting hypothesis states:

Hypothesis 1.3: *On the selected capital markets there are significant differences in the value relevance of book value and earnings, that is between accounting information provided by balance sheet as static financial statement and profit and loss account as dynamic financial statement.*

In order to analyse the differences in the value relevance of earnings and book value (measured by determination coefficients - R^2), i.e. in order to answer the question which accounting variable, earnings or book value is more value relevant, the Voung test is used (Voung, 1989, pp. 307–333). The Voung test tests the null hypothesis under which there is no difference in the explanatory powers of book value and earnings, versus the alternative hypothesis according to which one model has greater explanatory power. In this research the authors also analysed changes in the value relevance in the period 2005–2010. In order to analyse changes in the value relevance over time second research hypothesis was formed:

Hypothesis 2: *Value relevance of accounting information has increased over time.*

In testing the second research hypothesis and analysing changes in the value relevance of accounting information over time, the authors analysed the determination coefficients (R^2) in the observed period. When analysing the value relevance of accounting information in the context of capital markets of transition economies, it can be assumed that the value relevance has increased over time due to the development of capital markets but also due to the improvements of regulatory framework and financial reporting standards.

4.   Research results

4.1.   *A comparative analysis of the value relevance of accounting information*

The results of conducted research show that on all the observed markets accounting information earnings and book value are differently correlated to market prices. The highest total explanatory power of accounting information is measured on Slovenian capital market (74.5%) and the lowest on capital market of Republika Srpska (28.4%).

Generally observed, conducted value relevance analysis indicates conclusion that accounting information are value relevant, i.e. related to share prices which means that the first set hypothesis can be accepted as true.

The research results shown in Table 2 indicate that accounting information is value relevant on the observed capital markets, but they also indicate that there are certain differences in the value relevance among countries. These differences are even more noticeable when the value relevance of earnings and book value are observed separately (table 3). For example, in Slovenia there is a significant correlation of both accounting variables to share prices but the explanatory power for model with book value as an independent variable is quite higher (R^2 amounts 75.1%) than for a model where earnings is an independent variable (R^2 amounts 49.5%). In the Croatian case both accounting variables are also significantly related to share prices and explanatory power for a model with book value as an explanatory variable is higher (42.1%) than for a model where earnings is an explanatory variable (R^2 amounts 33.1%).

Analysis conducted at a Sarajevo Stock Exchange has shown that book value is significantly related to share prices while earnings are not. Explanatory power for a model with book value as explanatory variable equals 38.2% while the explanatory power for a model where earnings are independent variable is quite low and amounts 3.8%. The value relevance analysis on the Banja Luka Stock exchange indicated quite low correlation between share prices and book value (R^2 amounts 32.1%) while earnings are not significantly related to share prices, coefficient of determination is extremely low (1.7%) while the adjusted coefficient of determination is even negative (amounts –4.4%). Such results can be attributed to the small sample size and the characteristics of the market which is still pretty undeveloped and illiquid. On the Belgrade Stock Exchange both earnings and book value are value relevant and positively related to share prices. On this stock exchange the value relevance of book value is higher (R^2 amounts 51.2%) than the value relevance of earnings (R^2 amounts 27.0%). So the value relevance

Table 2.   Value relevance of accounting information in the observed countries.

Model variables Pit=a_0 + a_1Eit + a_2BVit		Ljubljana Stock Exchange		Zagreb Stock Exchange		Sarajevo Stock Exchange		Banja Luka Stock Exchange		Belgrade Stock Exchange	
		N = 16		N = 28		N = 19		N = 18		N = 16	
a_1	sig.	3.563	0.428	13.649	0.010	−2.857	0.271	2.643	0.686	0.691	0.874
a_2	sig.	1.457	0.002	1.314	0.001	0.946	0.004	0.740	0.011	1.305	0.024
R^2	sig.	0.779	0.0001	0.575	0.0001	0.460	0.007	0.368	0.032	0.546	0.006
Adj. R^2	sig.	0.745	0.0001	0.541	0.0001	0.393	0.007	0.284	0.032	0.476	0.006
σ^2		7,256.515		19,370.001		974.101		0.145		6,668.62	

Source: Authors calculation.

Table 3. Value relevance of earnings and book value on the observed capital markets.

Model variables		Ljubljana Stock Exchange N = 16		Zagreb Stock Exchange N = 28		Sarajevo Stock Exchange N = 19		Banja Luka Stock Exchange N = 18		Belgrade Stock Exchange N = 16	
$P_{it}=b_0 + b_1 E_{it}$											
b_1	sig.	16.071	0.001	20.559	0.001	2.945	0.209	4.064	0.606	8.689	0.023
R^2	sig.	0.529	0.001	0.356	0.001	0.091	0.209	0.017	0.606	0.319	0.023
Adj. R^2	sig	0.495	0.001	0.331	0.001	0.038	0.209	−0.044	0.606	0.270	0.023
$P_{it}=c_0 + c_1 BV_{it}$											
c_1	sig.	1.690	0.0001	1.716	0.0001	0.718	0.003	0.748	0.008	1.366	0.001
R^2	sig.	0.768	0.0001	0.442	0.0001	0.417	0.003	0.361	0.008	0.545	0.001
Adj. R^2	sig	0.751	0.0001	0.421	0.0001	0.382	0.003	0.321	0.008	0.512	0.001

Source: Authors calculation.

analysis for book value and earnings separately has shown that on the observed capital markets accounting information is value relevant. Book value is on all the observed capital markets positively and significantly correlated to share prices so the first supporting hypothesis (Hypothesis 1.1.) according to which there is empirically provable relation between share prices and book value can be accepted as true.

When the relation between earnings and share prices is analysed results indicate how earnings are significantly related to share prices in all the countries except Bosnia and Herzegovina. More precisely, earnings are not statistically correlated to share prices on Sarajevo and Banja Luka Stock Exchanges while on all the other observed markets (Ljubljana, Zagreb and Belgrade Stock Exchanges) earnings are significantly and positively related to share prices. According to such research results it can be concluded that second supporting hypothesis (Hypothesis 1.2.), which assumes empirically provable relation between share prices and earnings, was confirmed for three markets (Ljubljana, Zagreb and Belgrade Stock Exchanges) and for two markets (Sarajevo and Banja Luka Stock Exchanges) the hypothesis was not confirmed and thus cannot be accepted as true.

The analysis of the differences in the value relevance of earnings and book value was conducted using the Voung test. Namely, conducted value relevance analysis indicated certain differences in the value relevance of book value and earnings and these differences were mostly confirmed by the Voung test (Table 4). The Voung test shows statistically significant differences in the value relevance of book value and earnings at the level of 5% significance only for Serbia meaning that in this case the hypothesis which assumes significant differences in the value relevance of book value and earnings can be accepted as true. Differences in the value relevance of book value and earnings are significant at 10% level in the case of Slovenia and Federation of Bosnia and Herzegovina meaning that also in this two cases third supporting hypothesis can be accepted as true. Analysis of the statistical significance of differences in value relevance of book value and earnings on the Banja Luka Stock Exchange has not confirmed the assumed differences but when interpreting the results of the Voung test input data should be taken into consideration since they can cause such contradictory results. Namely, the conducted regression analysis has shown that earnings are not significantly related to share prices and adjusted determination coefficient was even negative. On the other side book value is positively and significantly related to share prices. Such results of the regression analysis indicate conclusion that on the Banja Luka Stock Exchange there are significant differences in the value relevance of book value and earning and despite results of the Voung test for this capital market third supporting hypothesis can be accepted as true. Results of the Voung test are not statistically significant for Croatian capital market meaning that for this market there are no differences in the value relevance of book value and earnings.

Table 4.   Results of the Voung test.

		Ljubljana Stock Exchange	Zagreb Stock Exchange	Sarajevo Stock Exchange	Banja Luka Stock Exchange	Belgrade Stock Exchange
	N	16	28	19	18	16
	R^2	0.779	0.575	0.460	0.368	0.546
	Adj. R^2	0.744	0.541	0.393	0.284	0.476
Voung test:	Z-statistic	−1.3017	−0.4695	−1.4587	−0.4274	−1.9688
	p-value	0.0965	0.3194	0.0723	0.3345	0.0245

Source: Authors calculation.

Table 5.   Value relevance of accounting information on the observed capital markets in the period 2005–2010.

Year	LJSE Adj. R^2	ZSE Adj. R^2	SASE Adj. R^2	BLSE Adj. R^2	BSE Adj. R^2
2005	0.861	0.697	0.427	−0.004	0.674
2006	0.876	0.842	0.423	0.669	0.666
2007	0.745	0.541	0.393	0.284	0.476
2008	0.791	0.418	0.413	0.437	0.386
2009	0.792	0.842	0.669	−0.056	0.552
2010	0.808	0.701	0.213	−0.022	0.558

Source: Authors calculation.

4.2. Analysis of changes in the value relevance in period 2005–2010.

Results of the conducted cross-time value relevance analysis on the observed capital markets are shown in Table 5. On the Slovenian capital market explanatory power of accounting variables had tendency of growth during 2005 and 2006 but at the end of 2007 decline in the value relevance was noticed. This decline was again followed by an increase in the explanatory power of accounting information and at the end of 2010 they explain about 80% of share prices. On the Zagreb Stock Exchange the explanatory power of accounting variables had growth tendency during 2005 and 2006 but it was followed by a decrease in the value relevance for the next two years. In 2009 there was an increase in the explanatory power of accounting information and it reached the level of 84.2% but this recovery was interrupted in the next year when the value relevance falls at level of 70.1% meaning that accounting information explain about 70% of share prices at Croatian capital market. On the Sarajevo Stock Exchange total explanatory power of accounting information was stagnating at a level of around 40% in the period 2005–2008. In 2009 it increased to 66.9% meaning that accounting information explained 66.9% of share prices. However, this year was the exception since the explanatory power falls again in 2010 at a level of 21.3%.

Variability in the value relevance of accounting information was noted on the Banja Luka Stock Exchange. Accounting information on this market in 2005 were not value relevant at all since the whole model was not significant. In the following three years there was a shift in the value relevance, and it can be concluded that there was a relationship between share prices and accounting information. However, in 2009 and 2010 this correlation was again insignificant so no conclusion on the value relevance could be made. Explanatory power of accounting information had a fall tendency in period 2005–2008 on the Belgrade Stock Exchange. The lowest level of value relevance, just 38.6%, was measured in 2008. During 2009 and 2010 there was increase in the value relevance and at the end of 2010 accounting information explain about 55% of share prices. Generally observed, results of cross-time value relevance analysis are not significant and the second research hypothesis, which assumed increase in the value relevance on the observed capital markets, was rejected. However, when interpreting research results the rather short time period in which analysis was conducted should be taken into consideration since different and longer period might result in different conclusions.

5.   Conclusion

Results of conducted research have shown that accounting information, i.e. book value and earnings are value relevant on all the observed capital markets. The analysis of

regression and determination coefficients has shown that on the observed capital markets value relevance of book value is higher than value relevance of earnings. Namely, on all the observed capital markets significant and positive relation between book value and share prices was evidenced while earnings were not significantly related to share prices on two out of five observed markets. Such results indicate how investors on observed markets attribute more relevance to accounting information shown in the balance sheet than to those shown in the profit and loss account. Analysis of changes in the value relevance in the period 2005–2010 indicated large oscillations in the explanatory power of the accounted variables and it could not be concluded that the value relevance increased over time as expected. However, changes and a decrease in the value relevance evidenced on all the capital markets might be attributed to influences from and a consequence of the global financial crisis which has not bypassed these, in world terms, relatively small capital markets.

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