Value Relevance of Earnings and Book Value: Evidence from Jordan

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Abstract

This paper examines the value relevance of earnings and book value of equity (individually and in aggregate), relative to price and return models, for Jordanian industrial companies for the period 1992 to 2002. The main findings of this paper are twofold. First, relative to price model, the value relevance of both earnings and book value (individually) have increased, whilst the value relevance of earnings increased and book value became irrelevant in their combination. Secondly, relative to return model, the value relevance of earnings either individually or in aggregate has increased while that of book value has declined. Overall, it is found that earnings are more important in explaining the variance in share price and return than book value. Furthermore, the results indicate that earnings and book value individually are more value relevant in price model. In contrast, these variables in aggregate are more value relevant in return model. The study shows that earnings help more in explaining market values in Jordanian industrial companies. This paper is the first in using price and return models in one study in Jordan.

Keywords: Price and return models, Value relevance, Earnings, Book value and Jordan

1. Introduction

Many decades ago, the early studies have focused on earnings (Chen, Chen and Su, 2001), while the recent ones have turned their attention to include book value of equity (Pirie and Smith, 2008). A lot of studies on the relationship between stock price or return and the accounting variables have been done and similar or different results have been conducted.

Examining this relationship tends to extract information that could be considered as a relevant one. The term value relevance has been used in literature to extract the ability of accounting information to summarize information that affects stock values (Francis and Schipper, 1999). While research on the value relevance of the accounting information has focused on the developed markets in Northern America and Europe, developing markets especially in the Middle East countries have been neglected (Al-Akra, Ali and Marashdeh, 2009; Anandarajan and Hasan, 2010).

Focusing more on developed markets than developing ones resulted in deficient understanding the differences in results. Due to that academic researchers are the primary producers and intended consumers of value relevance research (Barth, Beaver, and Landsman, 2001), the paper is of academic significance in filling this gap by extending the literature to include developing countries and providing a knowledge regarding the relevancy of accounting variables as reflected in equity values.

Due to the growing focus on the role of the accounting information in the global markets in the recent years (Chen et al., 2001), recent studies have examined the value relevance of the accounting information in

developing countries' markets (Alford, Jones, Leftwich and Zmijewski, 1993; Chen et al., 2001; Anandarajan and Hasan, 2010 among others).

This study is stimulated by the developments that occurred in the prior valuation studies. The study will expand the literature by examining the value relevance of earnings, book value of equity and a combination of them for the industrial companies listed in Amman Stock Exchange (ASE) as an emerging stock market. The current study will add further evidence about the value relevance of earnings and book value of equity in Jordan using price and return models. The question of the study is: Does the value relevance of earnings, book value of equity and their combination differ according to price and return models for Jordanian industrial companies? Addressing this question leads to indicate whether shifting from one valuation model to another yields different results for the value relevance. The study will continue by reviewing the related literature in the next section followed by the financial reporting in Jordan, hypotheses development and methodology, the empirical result and finally the summary and conclusions.

2. Literature review

2.1 Price and return models

According to the valuation theory, two valuation models are commonly used in value relevance studies namely the price and return models. Despite that they have the same theoretical foundations, their results are sometimes inconsistent (Ota, 2010).

Kothari and Zimmerman (1995) reviewed some studies that illustrate the price and return models' advantages and disadvantages. Theoretically, in the absence of well developed valuation theories, return model is superior to price model (Gonedes and Dopuch, 1974). While both models have been described as complementary (Lev and Ohlson, 1982), in some cases price model dominates return model (Landsman and Magliolo, 1988). Economically, both models are equivalent and return model is less problematic (Christie, 1987). The criticism do not prevent price model to persist (Barth, 1991; Harris, Lang and Mőller, 1994; among others).

2.2 Value relevance of earnings and book value

Studies on information value relevance conducted mixed results in different economic sectors. Using price and return models and data from US markets, some studies found that earnings and book value are largely irrelevant in wireless communication industrial sector (Amir and Lev, 1996). The incremental value relevance of earnings is declined and that of book value is increased in the industrial and services sectors (Francis and Schipper, 1999), while a weak association has been found between these accounting variables and market values (Lev and Zarowin, 1999).

Using price model, earnings are more value relevant in US companies than in German industrial and services companies (Harris et al., 1994). Book value is more value relevant than earnings in UK services and industrial sectors (Vardavaki and Mylonakis, 2007) and in Australian companies (Whelan, 2004). The value relevance of book value has increased in Korean industrial and service sectors (Gee-Jang, 2009) and in Indonesian sectors (Suwardi, 2009), while earnings have been found to be irrelevant (Gee-Jang, 2009). According to Bao (2004), both earnings and book value are value relevant in seven Asian markets (Hong Kong, Malaysia, Singapore, Thailand, Indonesia, the Philippines and Korea). In Jordan, few studies have examined the value relevance of the accounting information using price model (Hadi, 2005) and return model (Anandarajan and Hasan, 2010). Their samples showed that earnings are value relevant. Consistent with previous studies in different markets, it is expected for this study that the value relevance of earnings and book value relative to the both valuation models will be increased.

However, we confirm with what Ota (2010) argued in that there is no definite solution or demonstration for the inconsistent results between the price and return models. In the absence of the definite solution, it is beneficial to combine both price and return models and permit more definitive inferences (Kothari and Zimmerman, 1995). Employing the both models is the most suitable response although this may lead to indistinct conclusions (Ota, 2010).

3. Financial reporting in Jordan

Since 1988 Jordan has became a member of the board of International Accounting Standards Committee (IASC). So Jordan relies on International Accounting Standards (IASs) including IASs and International Financial Reporting Standards (IFRS) that are issued by International Accounting Standards Board (IASB) which make Jordan moves out of the confined local accounting requirements to the fold of the international arena (Al-Jajawy and Noor, 2003).

Although IASs have been adopted in Jordan, there is no doubt that Jordanian accounting environment needs to be developed in terms of strengthening the governance corporation with companies and the accountants and non-accountants' quality and training (Al-Jajawy and Noor, 2003). Actually, based on the accounting standards, an apparent lack of transparency has been observed in Jordan (Wallace and Shoult, 2004). This will be exacerbated by loosen regulation and lacking of business practices uniformity. It can be concluded that Jordan had made progress towards fiscal transparency, but still it was not sufficient (Anandarajan and Hassan, 2010).

Jordan had a limited accounting practice. This is because of the deficiency in recording transactions that satisfy only the outdated law requirements with no set form for financial statements. Indeed, Jordan suffered from many weaknesses in accounting regulation as the other developing countries did (Al-Akra et al., 2009). From the above discussion, we can notice that these limitations lead Jordanian financial reporting to yield confused information about firm value in ASE. To reduce this confusion, the current study will examine the value relevance of earnings and book value of equity to indicate whether they have the ability to reflect the firm value in Jordan since no study has been found in this country that examined the value relevance of these variables relative to price and return models.

4. Hypotheses development and methodology

4.1 Hypotheses development and models

While the value relevance of different accounting variables has been widely tested in developed stock exchanges relative to price or return models, few studies in developing stock exchanges include the two models in one study. Therefore, this study tries to examine the value relevance of earnings and book value of equity relative to the price and return models for Jordanian industrial firms. So, the study's first hypothesis will be;

H1a: Earnings are value relevant relative to price model.

H1b: Earnings are value relevant relative to return model.

Examining the association between the accounting information and firm value demands a valuation model. Recently, the most spread valuation model is built on Ohlson model (Barth, 2000; Barth et al, 2001; Ota, 2003, 2010). Ohlson model expressed the firm value as a function of earnings and book value. Depending on this formulation, the price and return models are drawn and they became the most extremely used regression models in value relevance studies. While the share price has been regressed on earnings and book value of equity in the price model, the stock return has been regressed on earnings (book value) and change in earnings (change in book value) in the return model (Ota, 2010) to indicate their ability to explain the variance in share price and return.

In order to test H1, the price and return models that will be used are;

$$P_{it} = \beta 0 + \beta 1 EPS_{it} + e_{it} \qquad (1)$$

$$R_{it} = \varphi 0 + \varphi 1 EPS_{it} + \varphi 2 \Delta EPS_{it} + e_{it} \qquad (2)$$

where for firm i at the end of a year t, P_{it} is share price; R_{it} is share return; EPS_{it} is earnings per share; ΔEPS_{it} is change in earnings per share and e_{it} is a random error term.

The second hypothesis relative to price model will be;

H2a: Book value is value relevant relative to price model.

Other accounting variables have been employed in return model to replace or to be added to earnings in many studies. For example Francis, Schipper and Vincent (2005) used dividends and change in dividends individually and in a combination with earnings and change in earnings in return model. For the purposes of this study, book value and change in book value will be hypothesized as below;

H2b: Book value is value relevant relative to return model.

To test H2, the price and return models that will be used are;

$$P_{it} = \lambda 0 + \lambda 1 BVPS_{it} + e_{it} \qquad (3)$$

$$R_{it} = \mu 0 + \mu 1 BVPS_{it} + \mu 2 \Delta BVPS_{it} + e_{it} \qquad (4)$$

where $BVPS_{it}$ is book value of equity per share and $\Delta BVPS_{it}$ is change in book value of equity per share for firm i at the end of a year t. other variables are defined before.

Consequently, in the next step, the analysis will continue to test the value relevance of the combined earnings and book value of equity relative to the both models. So, the third hypothesis will be;

H3a: Combined earnings and book value is value relevant relative to price model.

H3b: Combined earnings and book value is value relevant relative to return model.

To test the value relevance of the combined earnings and book value (H3), the price and return models that will be used are;

$$P_{it} = \omega 0 + \omega 1 EPS_{it} + \omega 2 \ BVPS_{it} + e_{it} \qquad (5)$$

$$R_{it} = \delta 0 + \delta 1 \ EPS_{it} + \delta 2 \ \Delta EPS_{it} + \delta 3 \ BVPS_{it} + \delta 4 \ \Delta BVPS_{it} + e_{it} \qquad (6)$$

where all variables are defined before.

The above regression models are widely employed in prior research to examine the value relevance of the accounting variables (Harris et al., 1994; Collins, Pincus and Xie, 1997; Pirie and Smith, 2008 among others). According to Pirie and Smith (2008), an initial research design involving pooled and annual regressions has been used with a basic empirical model that links share price (and return) with the two main accounting variables (earnings and book value of equity). This approach is widely used in the literature, thus it will be adopted in this study.

4.2 Sample and data selection

Study's sample is the Jordanian industrial firms listed in ASE. The data is collected from the database that is published by Amman Stock Exchange Information Center (ASEIC). Sample period starts from 1992 and ends on 2002. All Jordanian industrial firms with available data for the selected study's variables are included and the share price, return and other accounting variables are represented as values in Jordanian dinar (JD) per share at the financial year end. Total of 198 firms-years and (1188) observations-years (18 firms * 6 variables * 11 years) will enter the analysis to obtain the requested findings.

5. Empirical results

To run the regressions analysis, its assumptions will be checked for the study's variables and data. Descriptive statistics will be done to ensure the normality of the sample population distribution. We will link share price and return with the earnings, book value individually and in a combination to estimate the annual and pooled results to indicate the value relevance of these variables relative to price and return models.

5.1 Regression assumptions and descriptive statistics

Normality, linearity, homoscedasticity, correlation and multicollinearity assumptions have been checked for the study's variables and raw data. We found that share price and the change in book value have Kurtosis values well up and down ± 2 which suggests a non-normal distribution for these two variables. To eliminate the non-normal distribution, transformation process has to be done (Pallant, 2007). We found that logarithm (LOG10) transformation method is suitable to transform share price and change in book value of equity non-normal distribution into a normal one (refer to Appendix).

The descriptive statistics are reported in <Table 1>. Sample's valid and missing data, mean, standard deviation, minimum and maximum values are reported for the share price and return (as dependent variables) earnings, change in earnings, book value and change in book value (as independent variables). (Note 1) We missed data for change in book value. Totally, the remained observations for all variables are (1128) observations. From this table, it can be observed that standard deviation values (except that for return) are well below 3 which suggest the absence of the outliers (Pallant, 2007).

Insert Table 1 here

5.2 Regression results and discussion

The value relevance of the accounting information has been tested using annual and pooled data. We examine Hypotheses (1, 2 and 3) by regressing earnings and book value individually and in a combination on share price/return to determine the value relevance of these variables. For this purpose, regression models 1 to 6 have been applied. <Table 2> indicates the pooled regression results.

Insert Table 2 here

We conclude that both earnings and book value are value relevant in all 11 yearly regressions relative to price models (1 and 3). Earnings are value relevant in 10 out of 11 yearly regressions and book value in 2 out of 11 yearly regressions relative to return models (2 and 4). Both earnings and book value are value relevant in the pooled sample relative to the two valuation models (1, 2, 3 and 4). The value relevance of earnings is increased relative to both price and return models (models 1 and 2). This result is consistent with Hadi (2005) and

Anandarajan and Hasan (2010) respectively. The value relevance of book value is increased relative to price model while it is declined relative to return model (models 3 and 4). This results is consistent with Francis and Schipper (1999) and Ely and Waymire (1999) who concluded the same results for the both models. Changes in earnings and book value are value relevant in 2 and 9 out of 11 yearly regressions respectively supported by the pooled sample (models 2 and 4).

These results support H1a, H1b, H2a and H2b. This indicates that both earnings and book value have the ability to reflect the variance in market value of equity. The results show that earnings are strongly relevant in both valuation models. This is reflected by the high coefficients on earnings. This might be explained by that investors rely on earnings since they contain information that has been reflected in share price before releasing the earnings which are perfectly predictable (Francis and Schipper, 1999).

As it was expected, the results indicate that the value relevance of earnings individually is increased relative to both price and return models, likewise the value relevance of book value relative to price model. The results are inconsistent with Ramesh and Thiagarajan (1995) who concluded that the value relevance of earnings is declined over time and Amir and Lev (1996) who found that earnings and book value are largely irrelevant. Inconsistency has been found between our result and other studies that concluded a decline in the value relevance of earnings and an increase in the value relevance of book value (Barth, Beaver and Landsman, 1997; Berger, Ofek and Swary, 1996; Burgstahler and Dichev, 1997; Collins et al., 1997; Francis and Schipper, 1999; Ely and Waymire, 1999). Our results are inconsistent with Harris et al. (1994), Whelan (2004) and Vardavaki and Mylonakis (2007) who concluded that book value is more value relevant than earnings or with other studies that found book value to be value relevant while earnings are not (Gee-Jang, 2009).

For the combined earnings and book value relative to the price model (5), earnings are value relevant in 8 out of 11 yearly regressions as well as in the pooled sample. Book value is value relevant in 8 out of 11 yearly regressions but not in the pooled sample. As a result, the value relevance of earnings is increased, while book value is irrelevant. Relative to return model (6), earnings are value relevant in all yearly regressions and book value in 9 out of 11 yearly regressions supported by the pooled sample. As a result, the value relevance of earnings is increased, while that of book value is declined. Changes in earnings and book value are irrelevant in the pooled sample although they are relevant in 4 and 2 out of 11 yearly regressions respectively (model 6). These results support H3b but not H3a.

R^2 values and the significant F-statistics suggest that the six models are fitted the data well in testing the hypotheses. This implies that earnings and book value of equity individually are value relevant relative to both price and return models. The results of <Table 2> show that the R^2 values for the price model are greater than those for the return model. This is consistent with many studies (Harris et al., 1994; Francis and Schipper, 1999; Lev and Zarowin, 1999; Ely and Waymire, 1999). This indicates that the explanatory power of earnings and book value individually is greater in explaining the variance in share price than in share return, while in contrast, the explanatory power of the combined earnings and book value is much greater in explaining the variance in share return than in share price.

In total, the differences in results between price and return models from testing the three hypotheses might be explained by that (a) the two models sometimes yield inconsistent results (Ota, 2010), (b) price model is less biased and economically return model has less serious problems than price models (Kothari and Zimmerman, 1995), (c) as Francis and Schipper (1999) concluded, the decline in value relevance relative to return model could be resulted by the volatility increasing of market returns within the sample period or (d) the source of the inconsistency might be just for the period (1992 to 2002) in ASE. Overall, the paper conducted a difference in the results between price and return models in ASE as a developing market as well as those in developed market.

6. Summary and conclusion

The paper examined the value relevance of earnings and book value of equity individually and in a combination by employing Ohlson model (1995) relative to price and return models for Jordanian industrial firms including (1128) observations/years within the period 1992 to 2002. This paper contributes to the valuation literature in extending the valuation theory by examining the value relevance of the accounting information relative to the price and return models in an emerging market from Middle East region. Also, the paper contributes to ASE in strengthening the accounting practice in Jordan.

The value relevance of earnings is increased relative to the two valuation models, while that of book value is declined relative to return model. Combining earnings with book value increased the value relevance of earnings and insignificantly the value relevance of book value relative to price model, while it increased the value relevance of earnings and declined that of book value relative to return model.

The study faced some limitations. The study's data is collected to include only companies with available data for the selected sector, variables and years (1992 to 2002). Also, the current study couldn't compare its results with any of previous studies related to ASE. Future research is called to employ both price and return models to prove or disprove our results by extending sample size, periods and sectors. Also it is called to focus on examining the value relevance of accounting information relative to both valuation models in ASE alone or across developing or developed countries to enrich academic research and increase the knowledge in this area.

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Note

Note 1. Data about Skewness and Kurtosis before and after transformation is reported in Appendix 1.

Table 1. Descriptive statistics

	PRICE	RETURN	EPS	BVPS	ΔEPS	ΔBVPS
N Valid	197	198	198	198	198	139
Missing	1	0	0	0	0	59
Mean	.5230	12.2421	.3503	2.7951	.0237	-.9482
Std. Deviation	.36022	8.53204	.30590	2.00507	.22518	.53742
Minimum	-1.10	-21.44	-.20	.10	-.69	-2.00
Maximum	1.38	45.53	1.35	9.51	.87	.63

EPS: earnings per share; BVPS: book value of equity per share; ΔEPS: change in earnings per share; ΔBVPS: change in book value of equity per share.

Table 2. Pooled regression sample results

Models and Acc. Variables	Predicted Sign	Coefficient	t-statistics	R^2	F-statistics	Obs. No.
Price Model (1)				.486	186.328***	395
Earnings	+	.699	13.650***			
Return Model (2)				.360	57.896***	594
Earnings	+	.528	8.722***			
Δ Earnings		.174	2.872***			
Price Model (3)				.314	90.816***	395
Book value	+	.564	9.530***			
Return Model (4)				.264	25.735***	535
Book value	+	-.305	-3.783***			
Δ Book value		.574	7.124***			
Price Model (5)				.489	16.586***	593
Earnings	+	.619	8.225***			
Book value	+	.109	1.435			
Return Model (6)				.708	84.819***	931
Earnings	+	1.200	14.235***			
Δ Earnings		.003	.068			
Book value	+	-.888	-12.641***			
Δ Book value		.061	1.025			

Notes:
*** Significant at 1% levels.
Model (1): $P_{it} = \beta0 + \beta1\ EPS_{it} + e_{it}$
Model (2): $R_{it} = \varphi0 + \varphi1 EPS_{it} + \varphi2\ \Delta EPS_{it} + e_{it}$
Model (3): $P_{it} = \lambda0 + \lambda1 BVPS_{it} + e_{it}$
Model (4): $R_{it} = \mu0 + \mu1 BVPS_{it} + \mu2\ \Delta BVPS_{it} + e_{it}$
Model (5): $P_{it} = \omega0 + \omega1 EPS_{it} + \omega2\ BVPS_{it} + e_{it}$
Model (6): $R_{it} = \delta0 + \delta1\ EPS_{it} + \delta2\ \Delta EPS_{it} + \delta3\ BVPS_{it} + \delta4\ \Delta BVPS_{it} + e_{it}$

Appendix: Results of transformation process
Before transformation

		PRICE	RETURN	EPS	BVPS	ΔEPS	ΔBVPS
N	Valid	198	198	198	198	198	198
	Missing	0	0	0	0	0	0
Skewness		1.845	.223	1.012	1.723	.473	-.827
Std. Error of Skewness		.173	.173	.173	.173	.173	.173
Kurtosis		4.680	1.973	.363	2.313	2.870	15.628
Std. Error of Kurtosis		.344	.344	.344	.344	.344	.344

After transformation

		PRICE	RETURN	EPS	BVPS	ΔEPS	ΔBVPS
N	Valid	197	198	198	198	198	139
	Missing	1	0	0	0	0	59
Skewness		-.437	.223	1.012	1.723	.473	.025
Std. Error of Skewness		.173	.173	.173	.173	.173	.206
Kurtosis		1.230	1.973	.363	2.313	2.870	-.202
Std. Error of Kurtosis		.345	.344	.344	.344	.344	.408