

## Earnings and Stock Returns Models: Evidence from Jordan

Dr. Mohammad Fawzi Shubita

Assistant Professor, Accounting Department, Amman Arab University, Jordan

E-mail: mohammadshubita@yahoo.com

### Abstract

Customary accounting performance measures, like that of ROA, ROE and EPS is all frequently being used as the foundation when it comes to appraising a company's operating performance. It is the foundation of managerial compensations when it comes to bonus plans. All empirical research studies have shown that accounting based performance measures have a positive association when it comes to stock returns and it clarifies the important proportions of variations of stock returns.

(67) Companies represent the study sample for the period 2004-2011, the number of observations is (460) company-years measures.

The main findings indicate that the three models show that earnings and stock prices are positively and significantly related and the forecasting ability of return and differenced models are lower than price models.

Based on these results we recommend that improvement of the return-earnings relation through aggregation of stock earnings and returns over a long period of time.

**Keywords:** Stock Returns, EPS, Return-Earnings Models, Amman Stock Exchange.

### 1. Introduction

The relationship that is found between the stock returns and accounting accrual earnings is an extremely popular area for study on a global scale and for the past thirty years. Ball and Brown (1968) recorded the above-mentioned relationship in a large number of accounting literature. The goal of this literature is to try to figure out how is it possible to familiarize the incentives of the relationship between earnings and returns, while at the same time making it possible to predict future accounting performance measures from stock prices changes and vice-versa.

Beaver (1989) revealed that the EPS in financial statements gets the most attention from investors. Additionally, earning numbers are meant to aid financial accounting external users when it comes to predicting future cash flows and it is also meant to help them handle relative investments risks. This is why there have been several studies that have studied the option of realizing this objective. If there is an ability to bring to light the roots that cause the drive in the return earnings relation then that means that an environment were less risky decision making will have been created.

The main focus of accounting research is that it measures if stock prices have the ability to move towards the direction and magnitude of the specified earnings after that information has been revealed to the stock market. The literature for value relevance usually looks at the link that is found between the returns-earnings relation for the adjusted coefficient of determination ( $Adj-R^2$ ) in the forecasting models of stock returns when it comes to earnings.

The goal of this research is to study the link that is found between the published accounting accrual earnings and stock returns. The setting of this research will be in the context of the Jordan Capital Market. Most of the studies in this field concentrate on the well-developed capital markets. The problem in this is that it creates a gap in the literature when it comes to less developed and less organized stock markets. Consequently, this current research adds to the currently studies by probing the earnings topic importance when it comes to an emerging capital market, like that of Jordan. Using that as the basis various earnings and return relationship model specifications were examined (Price, Return, and Differenced models) that followed Kothari and Zimmerman (1995). This was done by using the yearly data from firms that have are listed on the ASE during an eight year time span (2004-2011).

Due to globalization most emerging markets, with the inclusion of Jordan have relaxed their restrictions on foreign investments. Taking a look at this issue be studying this topic in emerging markets should be of deep interest to investors both globally and locally. Furthermore, the findings of this research could help local policy makers when it comes to observing the financial disclosures for publicly held companies. Since the significance of traditional accounting measures when it comes to explaining variation in stock returns is as of late declining, revision of the regulations should be considered. These considerations should be taken when it comes to encouraging or even forcing firms to reveal nonfinancial measures and financial information that is needed to calculate the newly developed measures (such as EVA, Balance Scorecard).

The whole of the research is structured in the following manner. Then literature already available about the returns-earnings relation are reviewed. Lastly, the methodology of the study is introduced and the empirical results along with the conclusions are reported.

## 2. Literature Review

The link that is found between the accounting measures and the stock returns is what many empirical studies have focused on in the accounting literatures since Ball & Brown, (1968). Research in this line of field have relied on the link that is found between the stock returns with accounting performance measures, such as earnings or cash flows, when it comes to assessing the practicality of financial information for investors. Studies done early on that have looked at the usefulness of accounting based performance measures have revealed confirmation that shows that earning or/cash flow have a positive association with stock returns. It also goes on to explain a statistically significant proportion of stock return variations (e.g., Bowen et al., (1987). It should be noted that most of these findings report a weak earnings –returns association. The maximum  $R^2$  conveyed that this was 10%, showing that earnings describe a very small proportion of stock returns variations (Lev, 1989).

The quick changes that are found in the business environment has led to a discontent with traditional accounting measures. Amir and Lev, (1996) studied the forecasting ability of financial and nonfinancial information. The studied the information of independent cellular companies and did so by regressing stock price and stock returns through a set of financial (accounting) and nonfinancial variables.

The study's results show that accounting performance measures such as cash flows, earnings, and book values are unrelated when it comes to the valuation of cellular companies. Though it should be noted that when it is joined with nonfinancial measures when it comes to the price regression, accounting variables do then add to the explanation of stock prices. It has also been concluded that the predictive ability of nonfinancial information engulfs that of traditional accounting measures in cellular industry. It is also likely that this will be the situation for other science based, high growth sectors. Banker et al. (2000) studied the forecasting ability of some nonfinancial methods, such as customer satisfaction measures and they have indicated that they have indicated that customer complaints and returning customers are all adding factors for accounting measures in the hotel industry. The findings also suggest that the non-financial measures contain extremely important information that go beyond what was included in past financial measures.

Several papers have studied the capacity of return and price models, while at the same time looking at other alternative ways to enhance this relationship. Just as Kothari and Zimmerman (1995) agreed with the results by Dumontier and Labelle (1998) and Martikainen et.al (1997) they also agreed with the results that were found in France and Finland. Kothari and Zimmerman (1995) used two different income measurements, the adjusted earnings and the published figures. The conclusion is that the differenced model specification yields were lower than return model specification. The first model used adjusted earnings data while the other used the published accounting data. Dumontier and Labelle (1998) reach to the same results and assert that return model had the highest ability to evaluating the return-earnings relation.

Dimitropoulos and Asteriou, (2009) study applied four models that were tested by Kothari and Zimmerman (1995) to look at the earnings-return relationship. This was applied on Greek stocks during the time period of 1994 until 2004. The general result showed that there was a significant value relevancy in Greek stock market using the price model which gave a less biased earning-returns relationship comparing with return model. Similarly, the use of the time-series and cross-sectional aggregated data shows that there was an increase in the predictive ability of returns using accrual earnings and this resulted in a more significant Earnings Response Coefficients.

In emerging markets Alkhalialeh, (2008) delivers evidence of Jordan when it comes to the capacity of traditional earnings measures forecasting ability for the stock prices and returns diminishing in the 1990s. The findings revealed that the performance measures in 1980s was better in comparison with 1990s in the explanatory power to the stock returns. Furthermore, the consequences of this show that the accounting earnings based performance measures are in fact still significant as they have the ability to explain an important proportion of the variation in stock returns.

In the emerging markets also, Alfaraih and Alanezi, (2011) study on Kuwait the forecasting ability for book value and accounting earnings information during the period of 1995-2006. This was done empirically through the use of two valuation models (return and price models). The findings showed of two models that book value and accounting earnings are both individually and jointly linked. The findings indicate that the predictive ability of firms that are listed on the KSE were higher than other emerging and developed countries.

To conclude the explanatory power studies that were done in emerging countries used models that were similar to mature financial markets studies and the results were overall similar with those of mature markets. However there were some discrepancy that should be studied, in order for them to be better understood.

In conclusion it can be said that we have different results in regard to the valuation ability when it comes to the different model specifications. There are several researches that favor price model's forecasting ability because it has the best ability to reveal the relationship between returns and earnings. While another group claims that

return model performs better in comparison to other models. Yet all model stipulations provide econometric problems that are serious and show that it is meant to be used with caution and care in mind. As Kothari and Zimmerman (1995) have argued, the use of each model separately had the probability to give less substantial and reliable evidence instead of taking into consideration all model specifications.

### 3. Research Method

#### 3.1 Study Sample

Industrial companies listed on the Amman Stock Exchange during the period 2004-2011, represent the study sample. The required information for two consecutive years needs to be available at the least in for a study of this kind. After the criterion has been applied this criterion, 67 companies then went on to represent the study sample. The number of observations for this sample is 460 company-years measures; this was after deleting the outliers' observations.

#### 3.2 Study Hypotheses

H<sub>01</sub>: There is no statistical relationship between EPS and stock prices (Price Model).

H<sub>02</sub>: There is no statistical relationship between EPS divided by past year stock price and current stock prices divided by past year stock price (Return Model).

H<sub>03</sub>: There is no statistical relationship between EPS divided by past year stock price and change in stock prices divided by past year stock price (Differenced Model).

#### 3.3 Research Models and Variables

The following three models were used to predict the earnings-returns relation.

The relationship between share price and EPS is examined using model 1 (Price Model). It's used to test the first hypothesis.

$$P_{it} = \alpha_0 + \alpha_1 X_{it} + e_{it} \quad (1)$$

Where:

$\alpha_0, \alpha_1$ : Coefficients;

i: firm;

t: year;

X: earnings per share; which equal net income/total weighted average outstanding shares;

P: Closing price;

e = Error term.

The price model studies the link that is found between the stock prices and the earnings per share. It should be noted that we had two assumptions to evaluating these models. The first being that random walk is followed by earnings and secondly that returns do not lead accounting earnings, instead prices are setting inside the stock markets and this is done only by using the past and current time series of earnings (Dimitropoulos and Asteriou, 2009).

The return model examine the relationship between EPS divided by past year stock price and current stock prices divided by past year stock price.

$$P_{it} / P_{it-1} = \gamma_0 + \gamma_1 X_{it} / P_{it-1} + e_{it} \quad (2)$$

The returns model studies the link that is found between changes of accounting earnings and the stock returns.

On the other hand, stationary series can be produced using differenced model. It makes a stationary series by differencing the earnings and price measures. This is important because taking the first differences solve the econometric problems that show up in the forecasting of the price regression model. This is used to test the third hypothesis.

$$\Delta P_t / P_{t-1} = \beta_0 + \beta_1 X_{it} / P_{it-1} + e_{it} \quad (3)$$

Table (1) shows the descriptive measures of the key variables. When observing the table it reveals that the data is skewed to the right side because except of EPS<sub>t</sub>/P<sub>t-1</sub> the median of all variables is in fact lower, than the mean. This also shows that standard deviation for all variables (except P<sub>t</sub> /P<sub>t-1</sub>) are higher than the means. The maximum and minimum values indicate a large range of observation. Lastly the mean EPS is 0.087 JD, although the mean stock price is 2.61 JD. This provides a mean stock return of up to -0.007 during the whole period of investigation.

**Table (1): Descriptive Measures**

(67 Industrial companies listed on Amman Stock Exchange, 2004-2011, 460 observations)

| Variable | $P_t$  | $EPS_t$ | $P_t/P_{t-1}$ | $EPS_t/P_{t-1}$ | $\Delta P_t/P_{t-1}$ |
|----------|--------|---------|---------------|-----------------|----------------------|
| Mean     | 2.61   | 0.087   | 0.992         | -0.007          | -0.008               |
| Median   | 1.760  | 0.044   | 0.936         | 0.027           | -0.064               |
| SD       | 3.040  | 0.320   | 0.394         | 0.121           | 0.394                |
| Kurtosis | 33.363 | 26.744  | 4.164         | 4.644           | 4.164                |
| Minimum  | 0.250  | -0.583  | 0.159         | -0.614          | -0.841               |
| Maximum  | 34.890 | 3.180   | 3.172         | 0.254           | 2.172                |

**Notes:**

The study main variables descriptive statistics after deleting outliers defined as lowest of 1% and the highest 1% of the observations.

Variable definitions:  $P_t$  is stock price at year t,  $EPS_t$  is earnings per share at year t,  $P_t/P_{t-1}$  is current stock price divided by past stock price,  $EPS_t/P_{t-1}$  is earnings per share divided by past stock price,  $\Delta P_t/P_{t-1}$  is the change in stock prices divided by past stock price.

**4. Analysis and results**

**4.1 Correlation Analysis**

Looking at the Pearson correlations coefficients matrix among the study measures in table (2) we find a significant and positive relationship between the study variables.

It is reasonable to assume that there would be a positive relationship between the variables in the study. The highest correlation coefficient is between EPS and stock price which means that Jordanian investors increase the demand on stock prices that have high EPS which lead to increase in stock prices.

The variables expected when it comes to forecasting stock prices are significantly correlated to the stock price and of course to each other. When studying the independent variables inside price and the returns models they are also positively and significantly correlated to the stock returns which indicate that they expect to forecast stock returns.

**Table (2): Correlation matrix**

| Variable        | $EPS_t$ | $P_t/P_{t-1}$ | $EPS_t/P_{t-1}$ | $\Delta P_t/P_{t-1}$ |
|-----------------|---------|---------------|-----------------|----------------------|
| $P_t$           | 0.767** | 0.361**       | 0.342**         | 0.361**              |
| $EPS_t$         |         | 0.261**       | 0.597**         | 0.261                |
| $P_t/P_{t-1}$   |         |               | 0.273**         | 0.273**              |
| $EPS_t/P_{t-1}$ |         |               |                 | 0.273**              |

**Notes:**

The study main variables Pearson correlation coefficients after deleting outliers defined as lowest of 1% and the highest 1% of the observations.

Variable definitions:  $P_t$  is stock price at year t,  $EPS_t$  is earnings per share at year t,  $P_t/P_{t-1}$  is current stock price divided by past stock price,  $EPS_t/P_{t-1}$  is earnings per share divided by past stock price,  $\Delta P_t/P_{t-1}$  is the change in stock prices divided by past stock price.

\*\* Correlation is significant at the 0.01 level (2-tailed).

**4.2 Regression analysis**

The foundation of the economic explanation for the relationship between earnings and returns instigates from a fixed valuation model. In that model the operating cash flows are used as independent variable (Watts and Zimmerman, 1986; Ohlson, 1991). Current earnings are used now because the expectations for the market's cash flows from operating activities cannot be measured as an estimate for the market's expectation. There are three model specifications that will be used using stock prices and returns as dependent variables.

The statistical link that is found between the stock price and earnings is the main metric that is used when it comes to measuring the predictive ability of accounting figures. If accounting earnings are value relevant to external users, then a link will of course exist between the stock price and the earnings, and the coefficients of the earnings will be significant. The predictive ability ( $Adj-R^2$ ) of the regression model is used to measure this association.

The three regression models results are reported in Table (3). Model 1 aims to examining the stock price and EPS relation. The results show that coefficient on EPS is 7.724 and is statistically significant at the 0.01level. The adjusted  $R^2$  of this model is 58.7%.

In other hand, model 2 investigate the relationship between stock price and EPS the results show that coefficient on  $EPS_t/P_{t-1}$  is 0.888 and is statistically significant at the 0.01level. The adjusted  $R^2$  of this model is 7.3% so there is a huge decrease in the forecasting ability comparing with model 1.

Lastly Model 3 results show that coefficient on  $EPS_t/P_{t-1}$  is 0.888 and is statistically significant at the 0.01level. The adjusted  $R^2$  of this model is 7.3% which is the same comparing with model 2 but there is a huge decrease in the forecasting ability comparing with model 1.

The outcomes of the price regression model incline to be higher than the findings that were obtained from in Collins et al. (1997) that used the price model for a U.S. sample during the time period of 1953-1993. This was done to report the earnings and book value and explained 54% of the variation that was found in the security returns. However this current study obtained 58.7% in comparison to their 54%. In addition, when comparing with other emerging markets studies Jordanian industrial listed firms seem to be more value relevant. Bae and Jeong (2007) examined the forecasting ability of Korean companies' earnings and book values from 1987 until 1998. The findings of that study revealed that earnings clarified 34% of stock returns. At Egypt, in other side of the world, Ragab and Omran (2006) show that earnings and book value clarified 40% of the dissimilarity in share returns during the time period of 1998 until 2002.

To conclude the results of the price regression give substantial evidence that the value of earnings of ASE-listed firms that were reported during the period of 2004 and 2011 played a vital role in the equity valuation in the ASE and there is higher explanatory power in Jordan in comparison to other emerging and developed countries.

Just like the price model, the findings that were based on the returns model reveal that the investors measured ASE companies' earnings to be value relevant throughout the study period.

**Table (3): Regression analysis Results**

|  | <b>Model 1</b>                    | <b>Model 2</b>                    | <b>Model 3</b>                   |
|--|-----------------------------------|-----------------------------------|----------------------------------|
| <b>EPS<sub>t</sub></b>                 | <b>7.724**</b><br><b>(25.096)</b> |                                   |                                  |
| <b>EPS<sub>t</sub>/P<sub>t-1</sub></b> |                                   | <b>0.888**</b><br><b>(5.907)</b>  | <b>0.888**</b><br><b>(5.907)</b> |
| <b>Constant</b>                        | <b>1.981**</b><br><b>(20.636)</b> | <b>0.993**</b><br><b>(54.950)</b> | <b>-0.007</b><br><b>(-0.379)</b> |
| <b>F-test</b>                          | <b>629**</b>                      | <b>34.891**</b>                   | <b>34.890**</b>                  |
| <b>Adjusted R<sup>2</sup></b>          | <b>0.587</b>                      | <b>0.073</b>                      | <b>0.073</b>                     |

**Notes:**

Variable definitions:  $P_t$  is stock price at year t,  $EPS_t$  is earnings per share at year t,  $P_t/P_{t-1}$  is current stock price divided by past stock price,  $EPS_t/P_{t-1}$  is earnings per share divided by past stock price,  $\Delta P_t/P_{t-1}$  is the change in stock prices divided by past stock price.

Model 1:  $P_{it} = \alpha_0 + \alpha_1 X_{it} + e_{it}$ . Model 2:  $P_{it}/P_{it-1} = \gamma_0 + \gamma_1 X_{it}/P_{it-1} + e_{it}$ . Model 3:  $\Delta P_t/P_{t-1} = \beta_0 + \beta_1 X_{it}/P_{t-1} + e_{it}$

\*\* Correlation is significant at the 0.01 level (2-tailed). \* Correlation is significant at the 0.05 level (2-tailed).

**5. Conclusion and Recommendations**

Driven by the absence of research when it comes to the explanatory power of accounting information in emerging markets and the exceptional issues that is found in in Jordan, the goal of the research is to examine the predictive ability of accounting earnings and stock prices. This will be based on information that is produced by firms listed on the Amman Stock Exchange during the time period starting from 2004 until 2011. The information is used empirically through the use of the three valuation models, being price, returns and differenced models. The study revealed that the three models display that the earnings and the stock prices have a positive and significant relation. It also shows that the predicative ability of return and differenced models is in fact lower than price models.

Currently two opposite views exist on what caused the decrease in the relationship between accounting returns and market prices. The first view suggests that the lessening link is because of the changes that are found in the nature of earnings. The sequential increase that can be viewed in the asymmetry and lags of earnings, conditional conservatism, shows a strong predictive ability when it comes to the decreasing association that is found between accounting returns and market prices. Others claim that the growth in special items has decrease the resolve of accounting earnings, which in turn reduces the value of the relevance of earnings. The special items have created the decline in the association that is found between the revenue and the expenses and this decline of accounting earnings, and the increasing pattern of income variances.



The second assessment isolates a rise in the volatility of returns that is not connected to earnings, as a main drive for the lessening association. The temporal increase in the non-information-based trading is the main foundation of the decreasing association that is found between the earnings and the returns.

Numerous groups and individuals maintain that the traditional financial measures have reduced in relevance is because of the change in the business models, which is meant to reflect the new economy. It is reasonable to argue that the wide implementation of the recently established measure, an example being that of EVA and the increased recognition and implementation of non-financial performance measures, within the last decade, this shows or possibly adds to the supposed insufficiencies that are found in traditional accounting measures.

Outside the value irrelevant noise that is found in earnings that can affect the relationship models, one must contemplate that accounting earnings information are not accepted as fast as share prices information. This leads to a delay in the fusion of significant measures into the financial statements which means that the current earnings, does not attain the whole economic events.

The findings of the low value relevancy of the return and differenced models can be credited to the aptness of earnings recognition. If this really is the case, it is recommend that improvement of the relationship between returns and earnings through aggregation the data over a long period of time.

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