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Testing Value Relevance of Accounting income with Causality Test: Case of Turkey

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Abstract

“Income” is accounting’s summary measure of a firm performance so it occupies a central position in accounting literature. Accounting income is widely used in share valuation and to measure performance in management and debt contracts. The value-relevance of accounting information can be defined as the ability of financial statements to summarize information that affects firm value. Accounting theorists have generally examine the usefulness of accounting practices with a particular analytic models. The main purpose of this study is to examine the usefulness of accounting income with causality test. I use panel causality method to examine value-relevance of accounting income. My sample consists of 37 industrial firms listed on Borsa Istanbul during the period 2008 – 2014. The findings show that using causality test to measure value relevance of accounting amounts is valid.

Keywords: Borsa Istanbul; Causality Test; Accounting Income; Value-Relevance.

1. Introduction

A primary goal of financial reporting is aiding investors in making economic decisions. Academic researchers interested in understanding how accounting information affects economic decisions and which accounting variables are valued.

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Beginning with the seminal works by Ball & Brown [10] and Beaver [16], the link between accounting parameters and stock price has long been established in the theoretical and empirical accounting literature. These studies find that stock returns react to information on earnings, revenues and other financial disclosures.

Studies such as Ball & Brown [10] and Beaver [16] examine the role of accounting data in providing information to the market about events that may affect investors' perceptions of the firm. These studies are categorized as a "capital market studies" or "value relevance researches". Value relevance is defined as the association between accounting amounts and security market values. The key commonality in the definitions is that an accounting amount is deemed value relevant if it has a significant association with security market value. An accounting amount will be value relevant, only if the amount reflects information relevant to investors in valuing the firm and is measured reliably enough to be reflected in share prices.

The selection of the valuation model that is used in the tests is a primary research design consideration for value relevance research [6]. A frequently employed model is that based on Ohlson [4]. The Ohlson model represents firm value as a linear function of book value of equity and the present value of expected future abnormal earnings. The Ohlson model, as with all models, is based on simplifying assumptions that permit parsimonious representations of the complex real world such as perfect capital markets. So, model has been criticized. For example, Holthausen and Watts [13] criticizes value relevance research for being based on a valuation model that does not include the possibility of economic rents. They also criticizes value relevance research for being based on a linear, rather than nonlinear, valuation model. Despite criticized, Ohlson model might be seen as an answer to the question "what is the theoretical model measuring value-relevance?". Ohlson [4] provide a theoretical framework for accounting-based security valuation models.

Value relevance research need only assume that share prices reflect investors' consensus beliefs. With the assumption that share prices reflect investors' consensus beliefs, resulting inferences relate to the extent to which the accounting amounts under study reflect the amounts implicitly assessed by investors as reflected in equity prices. Value relevance research does not require assumptions such as market efficiency [6]. Value relevance research examines the association between accounting amounts and equity market values. This suggests testing whether accounting amounts explain cross-sectional variation in share prices.

There are several studies that examine relationship between income and stock price. Bernard [15] was one of the first to gauge the value relevance of accounting data. He compared the explanatory power of a model in which share price is explained by book value and earnings versus a model of share price based on dividends alone. He found that the accounting variables dominate dividends, which is interpreted as confirming the benefits of the linkage between accounting data and firm value. Dechow, Kothari, & Watts [8] implies earnings better predict future operating cash flows than current operating cash flows and the difference varies with the operating cash cycle.

Ball & Shivakumar [9] quantify the relative importance of earnings announcements in providing new information to the share market. Ball, Sadka, & Sadka [11] show that the earnings factors are priced. In other words, prices and earnings are closely related. Same as [9,17] implies that market participants use earnings

information in pricing. Koonce & Lipe [5] indicate that investors believe that earnings trend and benchmark performance both provide information about a firm's future prospects and management's credibility.

This paper proceeds as follows. Section 2 discusses which methods can be used to testing value relevance, including causality test. Section 3 discusses data, methods and key findings of research. Section 4 summarizes and provides concluding remarks.

2. Testing Value Relevance of Accounting Variables

Value relevance studies use various valuation models to structure their tests, and typically use equity market value as the valuation benchmark to assess how well particular accounting amounts reflect information used by investors. The tests often focus on the coefficients on the accounting amounts in the estimation equation [6]. Value relevance of accounting variables are generally tested by regression analysis. For example, models based on Ohlson [4] regarding the roles of financial statements are based on a regression of market value of equity on the two primary summary measures from the balance sheet and income statement, equity book value and net income:

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2NI_{it} + e_{it} \quad (1)$$

MVE is market value of equity, BVE is book value of equity, NI is net income before extraordinary items, and i denotes firms. Other factors which might be affect stock price are not included to analysis.

Determining which variables to include in the estimation equation is critical to value relevance researches which use regression analysis. Selection of included variables depends on the research question, and often is guided by the valuation model that forms the basis for the estimation equation [6].

In order to avoid variable selection problem or criticism raised against the model, causality tests might be used at value relevance researches. Causality governs the relationship between events. Formalizing this, the world consists of a collection of causal systems; in each causal system there is a set of observable causal variables [7]. Causal systems are observed on a set of variables. Hierarchical Bayesian model with theories of causality might be described as below using Bayes' rule [7].

Firstly, there must be a reasonable theories of causation. Positive accounting theory and Value Relevance Theory support relationship between accounting variables and stock prices. Next, causal model is generated basing on theories. Ohlson model is a one of the causal models for value relevance research. Finally, causality between two variables can be tested by causality tests from a set of observed data.

Granger Causality Test is the most widely used test for causality. Granger's approach [1] to the question of whether x causes y is to see how much of the current y can be explained by past values of x . y is said to be Granger caused by x if the coefficients on the lagged x 's are statistically significant. Granger causality measures information content. If we find that accounting amount (income e.g.) Granger causes stock price, it indicates the

value relevance of this accounting amount.

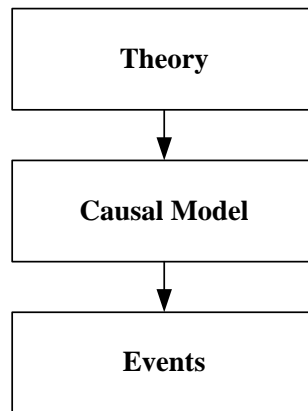


Figure 1: The Hierarchical Bayesian Model for Causality

The null hypothesis is that x does not Granger cause y and y does not Granger cause x . Granger causality test assumed that the variables are stationary. However, in the case of non-stationarity conditions but cointegration between the variables, the test can also be used with a correction term and in case of non-stationarity and absence of cointegration the test can be applied using the first difference of the variables [2]. So, before applying Granger Causality Test, stationary and cointegration must be examined.

A stationary series is to one with a constant mean, constant covariance and constant autocovariance for each given lag. In order to test for stationary Augmented Dickey – Fuller (ADF) unit root test can be used. The null hypothesis of ADF Dickey – Fuller unit root test is that the variable X_t is non-stationary. If variables are non-stationary, cointegration must be examined. Cointegration is a statistical property of a collection of time series variables. First, all of the series must be integrated of order 1. Next, if a linear combination of this collection is integrated of order zero, then the collection is said to be co-integrated. Given the presence of unit root process, it is important to test panel cointegration between variables before performing panel Granger Causality Test. Engle and Granger (1987) indicate that if non-stationary variables are cointegrated, it is necessary to add an error correction term to model to avoid from misspecification. Johansen Pedroni (Engle-Granger based) Cointegration Test can be applied to examine cointegration.

3. Data and Methods

Researches on value relevance of financial reporting are motivated by the fact that listed companies use financial statements as one of the major medium of communication with their equity shareholders and public at large. I use a balanced panel data set containing 37 industrial firms that issued on Borsa Istanbul over the quarterly period 2008Q1 – 2014Q4. Table 1 provides the descriptive statistics of the panel data set. The results indicate that for both variables the level data is stationary at level and first difference. Thus, testing cointegration of variables is not necessary before Granger Causality Test.

Granger-causality test results are sensitive to the choice of lag length. The optimal lag length is determined as four according to Schwarz Information Criterion (SIC). Granger causality test for panel data can be examined

with Arellano-Bond two-step system GMM estimators. Based on Arellano-Bond two-step system GMM estimators, a conclusion on causality will be reached by running Wald tests on the coefficients of the lagged Incomet's to check whether they are jointly statistically different from zero. Table 3 shows the results for Arellano-Bond two-step system GMM estimators.

Table 1: Descriptive Statistics

	Income	Stock Price
Mean	0.352925	7.059524
Median	0.255219	4.540000
Maximum	5.578093	56.75000
Minimum	-1.555124	0.210000
Std. Dev.	0.555003	7.814949
Skewness	4.278515	2.873073
Kurtosis	31.74554	13.49027
Jarque-Bera	29122.25*	4631.699*
Observations	777	777

* indicates the significance at %1 level.

Table 2 presents the results of the ADF – Fisher unit root test for both variables in levels and in first differences.

Table 2: ADF Unit Root Test

	Level	
	Constant	Constant + Trend
Income	129.265*	135.664*
Stock Price	66.793	103.138**
First Difference		
Income	388.063*	303.335*
Stock Price	392.320*	315.219*

* indicates the significance at %1 level.

** indicates the significance at %5 level.

Table 3: GMM estimation and causality results

	Coefficients	P - Value
Income (1)	0.390	[0.000]
Income (2)	-0.415	[0.000]
Income (3)	0.081	[0.000]
Income (4)	0.128	[0.000]
Wald Chi2	206068.35	[0.000]
Sargan Test	30.921	[0.998]
Wald Causality Test	Income does not cause Stock Price	
Null hypothesis	726.797	[0.000]

The Sargan test is used to test for the over identifying restrictions. The Sargan test is a test of the validity of instrumental variables used in estimation. The hypothesis being tested is that the instrumental variables are uncorrelated with residuals, and therefore may be used in estimation. The Sargan test result implies the validity of the instruments used in estimation.

The null hypothesis of Wald test is that x does not cause y . So, rejection of null indicates that Income is Granger-causes Stock Price. The Walt test rejects the null of no causality at the 1% significance levels.

4. Conclusions

The value-relevance of accounting information can be defined as the ability of financial statements to summarize information that affects firm value. Value relevance of accounting variables are generally tested by regression analysis. According to Gujarati [2], “although regression analysis deals with the dependence of one variable on other variables, it does not necessarily imply causation. In other words, the existence of a relationship between variables does not prove causality or the direction of influence”. In the light of this information, I examine value relevance of accounting income with causality test.

The results of this study suggest that income does Granger cause stock price. This results indicate that value relevance of income. Using causality test to examine value relevance of accounting amounts could be qualified as an alternative method or regression analysis and causality tests may be used together to examine value relevance of accounting amount.

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