The Effect Of Accounting Information Quality On Firm Performance And Firm Value: Evidence From Turkey[1]

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Abstract

The main purpose of study is to determine whether the quality of accounting information has an impact on firm performance and firm value. This study focus on manufacturing firms listed on the Borsa Istanbul. In this study, accounting based information quality models are used to determine the accounting information quality. Panel regression analysis is used to investigate the relationship between firm performance/value and accounting information quality. The regression analysis results show that accrual based accounting information quality indicators has a positive effect on firm performance indicators. According to the findings, firms' reporting of real profit amounts has a positive effect on firm performance and firm value indicators.

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[1] This study is derived from the doctoral dissertation titled "Examining the effect of accounting information quality on firm performance and firm value" completed in Erciyes University Institute of Social Sciences.

Muhasebe Bilgi Kalitesinin Firma Performansı ve Firma Değeri Üzerine Etkisi: Türkiye Örneği[2]

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Öz

Çalışmanın temel amacı, muhasebe bilgi kalitesinin firma performansı ve firma değeri üzerinde etkisinin olup olmadığını belirlemektir. Bu çalışma, Borsa İstanbul'da işlem gören imalat firmalarına odaklanmaktadır. Bu çalışmada, muhasebe bilgi kalitesini belirlemek için muhasebe bazlı bilgi kalitesi modelleri kullanılmıştır. Firma performansı/değeri ile muhasebe bilgi kalitesi arasındaki ilişkiyi araştırmak amacıyla panel regresyon analizi kullanılmıştır. Regresyon analizi sonuçları, tahakkuk esaslı muhasebe bilgi kalitesi göstergelerinin firma performans göstergeleri üzerinde olumlu bir etkiye sahip olduğunu göstermektedir. Elde edilen bulgulara göre firmaların reel kar tutarlarını raporlaması firma performansı ve firma değeri göstergeleri üzerinde olumlu bir etkiye sahiptir.

Anahtar Kelimeler: Muhasebe Bilgi Kalitesi, Fima Performansı, Firma Değeri

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[2] Bu çalışma, Erciyes Üniversitesi Sosyal Bilimler Enstitüsü'nde tamamlanan"Muhasebe Bilgi Kalitesinin Firma Performansı ve Firma Değeri Üzerine Etkisinin İncelenmesi" başlıklı doktora tezinden türetilmiştir.

1. INTRODUCTION

Accounting information is delivered to information users through financial statements. This information is accurate and reliable; it helps investors, lenders and other information users make accurate and consistent decisions. Although there is no generally accepted, clear and unambiguous definition about accounting information quality, it can be stated that accounting information should be right, accurate and appropriate for the needs of information users. The higher the quality of the accounting information as well as the quality of the financial statements, the decisions made by the information users will be more accurate. However, firms may tend to mislead information users due to different factors that may be in the interest of managers or firm owners.

In an environment where the quality of accounting information is damaged by various manipulation techniques, a negative image appears for external information users. In this context, it is necessary to investigate how accounting information quality affects firm performance and firm value indicators followed by information users such as managers, investors and/or lenders.

The purpose of this study is to investigate whether accounting information quality has an impact on firm performance and firm value. For this purpose, the effect of accounting information quality of firms operating in the BIST Manufacturing Sector on firm performance and firm value was examined empirically. In line with the purpose of the study, it is aimed to contribute to the literature by measuring the quality of accounting information with different models.

The second part of the study is devoted to the concepts of accounting information quality, firm performance and firm value. In the third section, the studies in the related literature are presented. The fourth section includes the data set, method and hypotheses of the study. In the fifth section, the analysis and findings are presented, and in the last section, the results and suggestions are expressed.

2. OVERVIEW OF ACCOUNTING INFORMATION QUALITY, FIRM PERFORMANCE AND FIRM VALUE

Accounting information quality is defined as the basic quality of the information used in international capital markets. On the other hand, the quality of accounting information is expressed as a measure of reflecting the economic situation of the firm in the financial reports. Information; It attracts the attention of users at any stage where it is produced, spread and used for the efficient allocation of capital. The more quality the information, the less uncertainty it contains (Francis, Olsson, et al., 2008: 267). So, high quality accounting information; information is that has been audited independently, prepared in accordance with accounting standards, showing the past and current status of firms in a transparent manner, and at the same time giving the opportunity to predict the future. In addition, it must be presented in full, impartial and timely manner, showing changes in financial status, firm performance and firm value, as well as providing all the qualifications required by accounting information users.

Reliability is an essential characteristic for accounting information to be useful for decision making. Reliability represents the extent to which the information is unbiased, free from error, and representationally faithful (FASB 1980: 2-3, Maines and Wahlen, 2006: 399). Firms' having high quality information, which is an important factor in the ever-developing competitive environment, is one of the requirements of continuing their activities and performing well. Firms with high quality accounting information can analyze their financial situation well and make right decisions for the future.

Due to success and continuity of a firm depends on the performance of the firm, managers will follow the current status and future performances of the firm through the information provided by the measurements. At the same time, they will help investors make decisions. For this reason, firms need performance measurement methods (Karaman, 2009: 415-417). Profitability rates are one of the important performance criteria because of investors, firm owners and stakeholders are more interested in profit figures and rates. The main purpose of firms is to maximize shareholder value. For this purpose, firm owners or investors who want to invest in that firm need valuation studies in order to measure the benefits and returns of the firm. The value of the assets of the firm and the value of the firm do not mean the same thing. For this reason, the firm owners, managers and investors are trying to reach the real value of the assets owned by the firm (Kepez, 2006: 164).

One of the purposes of the person doing valuation is to transmit the most appropriate value found after the determination of the firm value to the relevant person or persons. However; valuation done by different people can reach different conclusions. For this reason, there are various firm valuation methods in the literature to determine firm value. Firm valuation methods are also confused with firm performance criteria in the literature. For example, some researchers express Tobin's Q as one of firm value measurement methods (Xia, 2008: 38; Liu et al., 2012: 72; Jara et al., 2020: 260), while other researchers consider firm performance as one of measurement methods (Mahmud et al., 2009: 9; Yu, 2013: 79; Tang and Chang, 2015: 38; Yusrianti et al., 2016: 124; Brahma et al., 2020: 3).

3. REVIEW OF LITERATURE

Measurement of accounting information quality can be done through various indicators. These indicators reflect the accounting-based characteristics or market-based characteristics of profits. In addition, it is the measurement method called earnings management or earnings quality, which is the most frequently used criterion in the literature for the measurement of accounting information quality. The first studies on earnings management appeared in the 1980s. Empirical models for earnings management prediction are based on Healy (1985) study. In this study, total accruals in earnings management are divided into two as discretionary and nondiscretionary accruals. After this model, many different models using different variables and different methods were included in the literature (Jones, 1991: 210-211; Dechow et al., 1995: 199; Dechow and Dichev, 2002: 40; McNichols, 2002: 65-66).

The studies in the literature on the effect of accounting information quality, which is the main purpose of the study, on firm performance and firm value are summarized as follows. It is stated in the literature that earnings management, one of the methods of determining the quality of accounting information, has a negative effect on firm performance (Fang, 2009: 23; Gill et al., 2013: 129; Kao and Chen, 2007: 161; Kara and Tuna, 2018: 108; Mahmud et al., 2009: 17). Earnings management practices damage firm performance. In addition, there is a negative relationship between earnings management and earnings quality. For this reason, as the earnings quality of the firms increases, the firm performance increases (Huynh, 2018: 276; Mahmud et al., 2009: 17; Tang and Chang, 2015: 43-44). It has been demonstrated in international studies that firms with low earnings management practices (high earnings quality) have higher firm values (Fernandes and Ferreira, 2007: 16-19; Gaio and Raposo, 2011: 497).

4. HYPOTHESIS DEVELOPMENT

Firm managers, owners or shareholders, investors, financial institutions and the public are interested in the financial situation of the firm. These sides want to analyze firm performance and value for different purposes. However; when accounting information is not accurate and reliable,

it may mislead information users. For this reason, whether the accounting information is of high quality becomes an important problem.

Even if a large number of studies have emerged in the literature on various topics such as measurement of accounting information quality and factors affecting information quality, it is not enough number of studies examining the effect of accounting information quality on firm performance and firm value in the context of Turkey. Accordingly, it is aimed to determine whether firms with high quality accounting information have better firm performance and higher firm value.

The primary reason for firm management to manipulate may be to show firm performance better than it is (DeAngelo et al., 1994: 115; Richardson et al., 2002: 9). DeAngelo et al. (1994: 138) provided evidence that accruals will be manipulated by managers in an opportunistic way to hide poor performance or defer some unusual profits for future years. In addition, in the Burgstahler and Dichev (1997: 102) study, it was argued that managers manage profit to avoid the decrease in profit amounts and reporting losses. Various evidence has been obtained in the literature that accounting information quality and firm performance are related (Collins and Kothari, 1989: 178; Sloan, 1996: 291). Based on the literature reviewed, it is assumed that firms with high quality accounting information have better firm performance (Fang, 2009: 23; Gill et al., 2013: 129; Huynh, 2018: 276; Kao and Chen, 2007: 168; Mahmud et al., 2009: 6; Tang and Chang, 2015: 55). Under these assumptions, as the accounting information quality of firms increases, firm performances are expected to increase. Accordingly, the following hypotheses have been created to investigate the relationship between accounting information quality and firm performance.

H1: Accounting information quality has an impact on ROA.

H2: Accounting information quality has an impact on ROE.

H3: Accounting information quality has an impact on EPS.

High quality accounting information allows investors and management to make better decisions and increase firm value. In the literature reviewed, it is claimed that firms with high accounting information quality have higher firm value (Fernandes and Ferreira, 2007: 19 Gaio and Raposo, 2011: 497; Gill et al., 2013: 122-123; Li et al., 2013: 243). In line with these assumptions, firms with high quality accounting information are expected to have higher firm value. Accordingly, hypotheses have been created to investigate the relationship between accounting information quality and firm value.

H4: Accounting information quality has an impact on Tobin's Q.

H5: Accounting information quality has an impact on M/B.

H6: Accounting information quality has an impact on P/E.

5. METHODOLOGY

5.1. Sample Selection

The study sample consists of firms operating in the Manufacturing Sector in Borsa Istanbul (BIST). The period of the study covers the years 2005-2017. The reason for the determination of 2005 as the starting year, it is the difference in accounting methods and reporting used with the application of international accounting standards. In order for the study not to contain these differences, the application date of international accounting standards for the sample firms was determined as the starting period of 2005. In order for a firm to be included in the sample group, it has to operate uninterruptedly during the examination process and its data must be accessed

completely. When evaluated within the scope of these criteria, the study group of the study consists of 111 firms. Financial data of the companies in the sample were obtained from the Datastream database, Public Disclosure Platform and Borsa Istanbul's official website. In addition, EVIEWS 9 and STATA 14.2 programs were used to analyze data.

5.2. Measures of Accounting Information Quality

Five different models are used to determine the quality of accounting information. The models used are profit-based approaches that are thought to better capture the accounting quality of firms (Dechow et. al. 2010: 91). Accounting information quality models are as follows:

First, Jones Model (Jones, 1991: 211) was used, where total accruals were evaluated as a function of changes in sales and tangible assets. The residuals obtained from the Jones model are considered as an indicator of accounting information quality.

$$TA_t = \alpha/A_{t-1} + \beta_1\Delta REV_t + \beta_2 PPE_t + \varepsilon_t$$

The second model used as an indicator of accounting information quality is Modified Jones Model is the model proposed in Dechow et al. (1995: 199). In this model, residuals obtained from the following model are discussed.

$$TA_t = \alpha/A_{t-1} + \beta_1(\Delta REV_t - \Delta REC_t) + \beta_2 PPE_t + \varepsilon_t$$

Stubben (2010: 700), expressing the need to explain the change in account receivables during the period, argued that the undisclosed part consisted of the firms' discretionary income. In this context, the following model has been proposed in order to determine the quality of accounting information.

$$\Delta AR_{it} = \alpha + \beta\Delta R_{it} + \varepsilon_{it}$$

Francis, Nanda, et al. (2008: 67) calculated the earnings quality as the standard deviation of the firm's profit for 10 years. On the other hand, Bhattacharya et al. (2012: 459) suggests that a 7-year standard deviation can be used to calculate the earnings quality. In order not to reduce the number of observations, 7-year standard deviation was used to calculate the accounting information quality.

$$Accounting\ Information\ Quality = \sigma(\frac{EBXI}{A})$$

Another model used as an indicator of accounting information quality is the earnings smoothing. A low rate obtained according to this model shows that profits are smoothing more than cash flows, which is considered as an indicator of higher accounting information quality. The 5-year standard deviation of profit and cash flows was used to calculate the SMOOTH variable (LaFond et al., 2007: 11; Shuto and Iwasaki, 2014: 1221).

$$SMOOTH_i = \frac{\sigma(EBXI)}{\sigma(CFO)}$$

Apart from the mentioned models, the relationship between accounting information quality and firm performance and firm value has been examined by grouping the firms according to the indicators of earnings persistence and earnings predictability. Firms with low accrual quality are expected to have a low earnings persistence. Earnings persistence is measured with the following model:

$$EBXI_t = \alpha + \beta EBXI_{t-1} + \varepsilon$$

In the Lipe (1990: 50) study, a earnings predictability measure based on the variance of the shocks in the earnings process, where higher variance means lower predictability, was proposed.

According to Gaio and Raposo (2011: 474), earnings predictability is estimated by taking the square root of the variance of error terms of the earnings persistence model. According to this approach, while high variance values mean lower predictability, low variance values are considered as high predictability indicators.

$$Predict_i = \sqrt{[\sigma^2(\vartheta_{it})]}$$

5.3. Proxies of Firm Performance and Firm Value

Return on asset, return on equity and earnings per share were used to express the firm performance determined as the dependent variable of the study.

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

$$ROE = \frac{Net\ Income}{Total\ Equity}$$

$$EPS = \frac{Net\ Income}{Common\ Share}$$

Firm value indicators determined as other dependent variables are Tobin Q, market to book value ratio and price to earnings ratio.

$$Tobin's\ Q = \frac{(Equity\ Market\ Value\ +\ Liabilities\ Market\ Value)}{(Equity\ Book\ Value\ +\ Liabilities\ Book\ Value)}$$

$$M/B = \frac{Stock\ Price}{Book\ Value\ per\ Share}$$

$$P/E = \frac{Price\ per\ Share}{Earnings\ per\ Share}$$

In addition, firm size, growth rate and financial leverage ratio were determined as control variables within the scope of the study (Ahmed et al., 2002: 876; Ahmed and Duellman, 2007: 422; Krishnan and Visvanathan, 2008: 6; Rahman and Ali, 2006: 792).

The existing models in the literature were used to investigate the relationship between accounting information quality, which is the main purpose of the study, and firm performance and firm value. The relationship between firm performance and accounting information quality can be explained through the following models (Fang, 2009: 18-19; Lopes et al., 2011: 4-5; Moshi, 2016: 28):

$$ROA_{it} = \beta_0 + \beta_1 AQ_{it} + \beta_2 Size_{it} + \beta_3 Growth_{it} + \beta_4 Lev_{it} + \varepsilon_{it} \quad \text{(Model 1)}$$

$$ROE_{it} = \beta_0 + \beta_1 AQ_{it} + \beta_2 Size_{it} + \beta_3 Growth_{it} + \beta_4 Lev_{it} + \varepsilon_{it} \quad \text{(Model 2)}$$

$$EPS_{it} = \beta_0 + \beta_1 AQ_{it} + \beta_2 Size_{it} + \beta_3 Growth_{it} + \beta_4 Lev_{it} + \varepsilon_{it} \quad \text{(Model 3)}$$

The following models were used to examine the relationship between firm value and accounting information quality (Gaio and Raposo, 2011: 484; Li et al., 2013: 244):

$$Tobin_{it} = \beta_0 + \beta_1 AQ_{it} + \beta_2 Size_{it} + \beta_3 Growth_{it} + \beta_4 Lev_{it} + \varepsilon_{it} \quad \text{(Model 4)}$$

$$M/B_{it} = \beta_0 + \beta_1 AQ_{it} + \beta_2 Size_{it} + \beta_3 Growth_{it} + \beta_4 Lev_{it} + \varepsilon_{it} \quad \text{(Model 5)}$$

$$P/E_{it} = \beta_0 + \beta_1 AQ_{it} + \beta_2 Size_{it} + \beta_3 Growth_{it} + \beta_4 Lev_{it} + \varepsilon_{it} \quad \text{(Model 6)}$$

5.4. Methodology

Since the data set of the research includes both horizontal section data of different firms and the time series of the firms, panel data analysis method was used in the study. Panel data could be generated by pooling time-series observations across a variety of cross-sectional units In addition, panel data analysis allows time and unit size to work with more data as it handles simultaneously (Baltagi, 2021: 9). Within the scope of this study, the necessary tests have been applied to obtain reliable results in panel data analysis.

Table 1. Variable Definition

Variables	Definiton
ROA	Return On Assets
ROE	Return On Equity
EPS	Earnings Per Share
Tobin Q	Tobin's Q
M/B	Market to Book Ratio
P/E	Price to Earnings Ratio
Jones	Accounting information quality metric values obtained from Jones Model
MJones	Accounting information quality metric values obtained from Modified Jones Model
Stubben	Accounting information quality metric values obtained from Stubben Model
Francis	Standard deviation of earnings from the Francis Model
Smooth	Metric values obtained from the earnings smoothing model
Size	Firm Size
Growth	Percentage Change In Total Assets
Lev	Financial Leverage

Descriptive statistics about the variables used in the models established to investigate the relationship between accounting information quality and firm performance and firm value are shown in *Table 2*.

Table 2. Descriptive Statistics

Variables	Obs	Mean	SD	Min	Max	Q-Q Plot Results
ROA	1332	0,047	0,121	-2,885	0,475	Normal Distrubition
ROE	1332	0,066	0,341	-4,775	2,051	Normal Distrubition
EPS	1332	1,099	4,99	-13,638	105,98	Normal Distrubition
Tobin's Q	1332	1,259	1,281	0,216	15,002	Normal Distrubition
M/B	1332	1,797	6,254	-177,58	74,6	Normal Distrubition
P/E	1332	10,287	39,774	-321,9	277,96	Normal Distrubition
Jones	1332	4,50e-09	0,113	-0,848	1,027	Normal Distrubition
MJones	1332	7,57e-09	0,114	-0,858	1,079	Normal Distrubition
Stubben	1332	-1,15e-08	0,071	-0,325	0,409	Normal Distrubition
Francis	777*	0,053	0,066	0,004	1,006	Normal Distrubition
Smooth	888*	0,905	0,907	0,050	11,053	Normal Distrubition
Persist	444*	0,084	0,363	-1,601	2,413	Normal Distrubition
Predict	444*	0,055	0,038	0,008	0,262	Normal Distrubition
Size	1332	19,825	1,445	16,297	24,281	Normal Distrubition
Growth	1332	0,136	0,280	-0,618	4,685	Normal Distrubition
Lev	1332	0,565	3,189	-97,527	20,298	Normal Distrubition

Descriptive statistics include the mean, the standard deviation and the maximum, minimum values for the 13 years in *Table 2*. Statistical methods are based on various underlying

assumptions. One common assumption is that a random variable is normally distributed. Q-Q (quantile-quantile) plot is a good chart for testing normality. Q-Q plots are arguably the most widely used method of distributional assessment. Based on a visual inspection in a Q-Q plot, a sample is therefore considered to be consistent with a normal distribution if the empirical and theoretical quantiles fall close to the line representing the theoretical distribution (Loy et al., 2014: 202). According to the unreported Q-Q plot results, it can be indicated that the variables are normally distributed. It is concluded that the variables used in the study meet the normal distribution assumptions.

Pairwise correlation analysis was conducted to investigate whether there are multiple linear connection problems between independent variables and Variance Inflation Factor (VIF) values, which are accepted as the main indicator for the detection of this problem, were examined. According to the findings, the VIF values of the variables in the models vary between 1,00 and 1,06. The calculated VIF values do not exceed the threshold value of 10 (Field, 2009: 224; Gujarati, 2004: 362; Myers, 1990: 127), it can be evaluated that there is no multiple connection problem in the variables used in the study.

In order to determine the absence of multicollinearity problems, the Pairwise correlation coefficients between explanatory variables were tested. Correlation findings of the variables used in the study are used in *Table 3*.

Table 3. Correlation Matrix

	ROA	ROE	EPS	Tobin Q	M/B	P/E	Jones	MJones
ROA	1							
ROE	0,30***	1						
EPS	0,26***	0,14***	1					
Tobin Q	0,17***	0,06**	0,13***	1				
M/B	0,10***	-0,09***	0,05*	0,29***	1			
P/E	0,09***	0,09***	0,04	0,16***	0,02	1		
Jones	0,40***	0,17***	0,09***	0,04*	0,02	0,04	1	
MJones	0,40***	0,17***	0,08***	0,04	0,02	0,04	0,99***	1
Stubben	-0,01	-0,04	-0,07***	-0,01	0,01	0,03	0,18***	0,19***
Francis	-0,17***	0,16***	-0,00	0,10***	-0,01	-0,05	-0,09***	-0,09***
Smooth	-0,07**	-0,07**	-0,07**	-0,06*	-0,08**	-0,06*	0,03	0,03
Persist	0,09*	0,06	0,10**	0,02	0,02	0,04	0,04	0,04
Predict	0,10**	0,03	0,13***	-0,05	-0,09*	-0,13***	0,04	0,04
Size	0,11***	0,11***	-0,01	-0,09***	-0,00	0,07***	-0,04	-0,04
Growth	0,12***	0,14***	0,03	-0,03	0,00	0,03	0,02	0,05*
Lev	-0,00	-0,26***	-0,00	-0,00	0,80***	-0,01	0,01	0,01
	Stubben	Francis	Smooth	Persist	Predict	Size	Growth	Lev
ROA								
ROE								
EPS								
Tobin Q								
M/B								
P/E								
Jones								
MJones								
Stubben	1							

Francis	*-0,01*	*1*						
Smooth	*-0,01*	*0,28****	*1*					
Persist	*0,03*	*0,12****	*0,07*	*1*				
Predict	*-0,02*	*0,18****	*0,20****	*-0,04*	*1*			
Size	*-0,07****	*-0,21****	*-0,03*	*-0,04*	*-0,01*	*1*		
Growth	*0,01*	*0,01*	*0,02*	*0,05*	*-0,04*	*0,08****	*1*	
Lev	*-0,00*	*-0,05*	*-0,07***	*-0,04*	*0,02*	*0,05**	*0,03*	*1*

Another test required to perform panel data analysis and to increase the accuracy of the findings is to test the stationarity of the time series related to the variables. Im et al. (2003) IPS test, one of the first generation unit root tests, was used to test the stationarity of the models (Table 4).

Table 4. IPS Panel Unit Root Results

	Fixed		Fixed+ Trend		
	Statistic	*p-value*	*Statistic*	*p-value*	
ROA	*-9,870*	*0,000*	*-13,344*	*0,000*	*Stationary*
ROE	*-10,634*	*0,000*	*-13,770*	*0,000*	*Stationary*
EPS	*-5,928*	*0,000*	*-10,829*	*0,000*	*Stationary*
Tobin Q	*-4,478*	*0,000*	*-6,668*	*0,000*	*Stationary*
M/B	*-4,360*	*0,000*	*-9,948*	*0,000*	*Stationary*
P/E	*-12,855*	*0,000*	*-14,300*	*0,000*	*Stationary*
Jones	*-14,742*	*0,000*	*-16,317*	*0,000*	*Stationary*
DJones	*-14,818*	*0,000*	*-16,327*	*0,000*	*Stationary*
Stubben	*-16,408*	*0,000*	*-16,222*	*0,000*	*Stationary*
Francis 0	*3,085*	*0,999*	*-1,177*	*0,120*	*Non-Stationary*
Francis 1	*-15,325*	*0,000*			*Stationary*
Smooth 0	*-1,517*	*0,065*	*-2,295*	*0,011*	*Non-Stationary*
Smooth 1	*-7,563*	*0,000*			*Stationary*
Size	*12,165*	*0,000*	*-1,334*	*0,000*	*Stationary*
Growth	*-12,847*	*0,000*	*-7,7361*	*0,000*	*Stationary*
Lev	*0,616*	*0,000*	*13,141*	*0,000*	*Stationary*

When the findings in the table were examined, it was determined that the series related to Francis and Smooth variables were not stationary and became stationary when the first lag was taken. Since the other variables are stationary, but Francis and Smooth variables are stationary at the first lag, Francis and Smooth variables are used in the analyzes to be made after this stage, by taking the first lag.

In the analysis of the models used in the study, F test, LM test and Hausman test were performed in order to determine which pooled, random effects and fixed effects estimators would give more consistent results. According to the results of the LM test, it was decided that the random effects model was more effective in models with a value of P <0.05, and the fixed effects model was more effective in the case of P <0.05 as a result of the Hausman test. According to the unreported test results, the random effects estimator was found to be more effective in the models used in the study.

On the other hand, in order to obtain accurate and reliable results from the analysis findings, it is necessary to investigate whether there are heteroscedasticity and autocorrelation problems in the models. Wooldridge test was used to determine whether there are autocorrelation problems among the error terms. In addition, Wald test and likelihood ratio test were used to determine whether there is a variance problem in the models. According to the unreported results, it has been determined that there are models that include autocorrelation and heteroscedasticity problems and for the purpose of correcting these problems, the standard errors related to the

coefficients were predicted by clustering at the firm level (Stock and Watson, 2008, p. 155) and PCSE (Panel-Corrected Standard Errors) estimators (Greene, 2012).

6. RESEARCH FINDINGS

Regression analysis of the models established to investigate the relationship between accounting information quality and firm performance is presented in *Table 5*.

Table 5. Firm Performance and Accounting Information Quality Analysis Findings

Panel A: ROA Variables	Jones	MJones	Stubben	Francis	Smooth
Constant	-0,071	-0,073	-0,092**	0,022	0,015
AQ	-0,201**	-0,192**	-0,127	-0,216***	-0,012***
Size	0,007***	0,007***	0,008***	0,002	0,002
Growth	0,053***	0,054***	0,047***	0,045***	0,045***
Lev	-0,0004	-0,0004	-0,0002	-0,004	-0,005
R^2	0,052	0,051	0,037	0,150	0,120
N	1332	1332	1332	666	777
Sign.	44,20***	44,04***	42,98***	239,20***	60,47***
Year Effects	Yes	Yes	Yes	Yes	Yes
Panel B: ROE Variables	**Jones**	**MJones**	**Stubben**	**Francis**	**Smooth**
Constant	-0,424***	-0,426***	-0,382***	-0,542***	-0,432***
AQ	0,176	0,181	0,022	0,305	-0,031*
Size	0,024***	0,024***	0,023***	0,033***	0,028***
Growth	0,145**	0,143**	0,151**	0,184***	0,183***
Lev	-0,029**	-0,029**	-0,029**	-0,095***	-0,096***
R^2	0,127	0,127	0,125	0,506	0,481
N	1332	1332	1332	666	777
Sign.	75,91***	75,44***	73,91***	57,79***	72,16***
Year Effects	Yes	Yes	Yes	Yes	Yes
Panel C: EPS Variables	**Jones**	**MJones**	**Stubben**	**Francis**	**Smooth**
Constant	2,098	2,080	2,059	-5,080	-0,500
AQ	2,120	2,285	3,009	0,356	-0,425***
Size	-0,020	-0,020	-0,018	0,293*	0,093
Growth	0,886*	0,857*	0,932*	1,065**	0,529
Lev	0,003	0,003	-0,0006	-0,027	-0,020
R^2	0,035	0,035	0,033	0,070	0,022
N	1332	1332	1332	666	777
Sign.	29,14***	29,08**	27,20**	44,77***	28,74***
Year Effects	Yes	Yes	Yes	Yes	Yes

AQ refers to the quality metrics obtained from the Jones, DJones, Stubben, Francis and Smooth models, respectively.
* %10 significiance level, ** %5 significiance level,*** %1 significiance level.

As the residual values obtained from Jones, MJones and Stubben models, which are the accounting information quality indicators, are zero sum and can take negative or positive values, the absolute values of the values obtained from the mentioned models are examined and the effect of the accounting information quality on the firm performance is examined. Accounting information quality increases as residual values get closer to zero, and accounting information quality deteriorates as residuals move away from zero. Negative and significant effects were determined between the accounting information quality and ROA in terms of Jones and MJones indicators. It is evaluated that Jones and MJones variables get away from zero as the quality of accounting information deteriorates, and closer to zero is considered to be better than accounting information quality. On the other hand, when the regression findings between the values obtained from Francis and Smooth models and ROA were examined, statistically significant negative coefficients were obtained. Accordingly, the findings can be interpreted as the increase in the quality of accounting information increases, as well as the firms' return on assets. When the findings are evaluated, it is seen that the H1 is supported by Jones, MJones, Francis and

Smooth models. It is seen that Smooth variable has statistically significant and negative effects on ROE and EPS dependent variables. However, it is determined that other accounting information quality indicators have no significant effect on ROE and EPS. Therefore, H2 and H3 are only supported by the findings from the Smooth model. Since Francis and Smooth models have negative correlations with other accounting information quality indicators (Dechow et. al, 2010: 7), they are in line with our findings.

When the findings of the analysis, in which the effect of accounting information quality on firm performance is investigated, it can be stated that some studies in the literature are supported and different findings are reached with some studies. According to the findings obtained, it supports the studies conducted in the literature that accounting information quality has an impact on firm performance (Fang, 2009: 26; Gill et al., 2013: 129; Huynh, 2018: 275; Kao and Chen, 2007: 170; Maherani et al., 2014: 93; Mahmud et al., 2009: 18; Tang and Chang, 2015: 55). There are also studies in the literature that the quality of accounting information has no effect on firm performance (Ahmadi and Safarzadeh, 2015; Ajit et al., 2013: 19; Moshi, 2016: 49).

The analysis findings of the hypotheses established to investigate the relationship between accounting information quality and firm value are given in *Table 6*.

Table 6. Firm Value and Accounting Information Quality Analysis Findings

Panel D: Tobin Q					
Variables	Jones	MJones	Stubben	Francis	Smooth
Constant	2,560***	2,574***	2,557***	9,038	4,640*
AQ	0,288	0,184	0,120	-1,737***	-0,078***
Size	-0,072*	-0,072*	-0,071*	-0,387	-0,160
Growth	0,023	0,025	0,032	0,039	-0,058
Lev	0,002	0,002	0,002	0,010**	0,013**
R^2	0,101	0,100	0,101	0,094	0,051
N	1332	1332	1332	666	777
Sign.	97,10***	96,54***	96,85***	17,00***	64,71***
Year Effects	Yes	Yes	Yes	Yes	Yes
Panel E: M/B					
Değişkenler	Jones	MJones	Stubben	Francis	Smooth
Constant	4,206***	4,197***	4,168***	5,246*	3,524
AQ	0,627	0,658	1,010	-4,982***	-0,245**
Size	-0,178**	-0,178**	-0,177**	-0,159	-0,068
Growth	-0,665	-0,672	-0,652	-0,046	-0,111
Lev	1,574***	1,574***	1,573***	0,449***	0,632***
R^2	0,646	0,646	0,646	0,395	0,199
N	1332	1332	1332	666	777
Sign.	454,87***	454,42***	457,28***	456,51***	142,35***
Year Effects	Yes	Yes	Yes	Yes	Yes
Panel F: P/E					
Değişkenler	Jones	MJones	Stubben	Francis	Smooth
Constant	-20,237	-19,937	-26,367*	-6,231	-18,421
AQ	-30,457**	-31,410**	-1,041	-10,839	-0,978
Size	1,256*	1,245*	1,463**	0,937	1,235
Growth	5,705	6,022	4,614	4,311*	4,896**
Lev	-0,210	-0,213	-0,198	-0,439	-0,925
R^2	0,020	0,020	0,016	0,004	0,013
N	1332	1332	1332	666	777
Sign.	27,46**	27,99**	22,49**	8,53*	15,81*
Year Effects	Yes	Yes	Yes	Yes	Yes

AQ refers to the quality metrics obtained from the Jones, DJones, Stubben, Francis and Smooth models, respectively.
* %10 significiance level, **%5 significiance level,*** %1 significiance level.

When Table 5 is examined, it is determined that Francis and Smooth variables have a negative effect on Tobin Q and M / B dependent variables. Considering that the standard deviation values

obtained from the Francis and Smooth models have a negative relationship with the accounting information quality, the increase in the accounting information quality leads to an increase in Tobin Q and the market value / book value ratios. It has been determined that the quality of accounting information has a negative and significant effect on the P / E dependent variable in terms of Jones and MJones indicators. When the hypotheses investigating the effect of accounting information quality indicators on firm value were evaluated, it was determined that Francis and Smooth models, one of the quality indicators, supported the H4 and H5 hypothesis, and the H6 hypothesis was supported through Jones and MJones models.

When the findings of the analysis, in which the effect of accounting information quality on firm value is analyzed, it is seen that the findings support the existing studies in the literature (Anderson et al., 2014: 13; Fernandes and Ferreira, 2007: 19; Gaio and Raposo, 2011: 485; Gill et al., 2013: 129; Li et al., 2013: 246; Yusrianti et al., 2016: 129). When the literature is examined, there are studies in which the impact of accounting information quality on firm value is expressed as well as studies in which non-significant findings are identified (Sarun, 2016: 141-142).

Other indicators of accounting information quality are earnings persistence and earnings predictability coefficients. In the study, according to the two accounting information quality indicators, the firms in the review group were sorted and the firm performance and firm value indicators were examined. Firms in the review group were first listed in descending order according to the earnings persistence coefficients. This sorting also reflects the strength of the relationship between earnings that occur one after another. After the sorting, firms are grouped as 25%, 20% and 10%. The aim is to determine whether the ROA, ROE, EPS, Tobin's Q, M/B and P/E ratios differ between the group with the highest value and the group with the lowest value in the earnings persistence coefficient to make a more precise interpretation.

Table 7. Firm Performance and Firm Value by Earnings Persistence Measure

	Firm Performance			Firm Value		
	ROA	ROE	EPS	Tobin Q	M/B	P/E
1	0,069	0,118	1,936	1,317	2,198	14,935
2	0,064	0,096	0,988	1,315	2,331	17,858
3	0,045	0,068	0,675	1,180	2,230	9,680
4	0,056	0,087	1,166	1,257	1,978	11,367
1	0,077*	0,142**	2,326*	1,331	2,218	13,389
2	0,062	0,070	0,936	1,382	2,288	16,625
3	0,052	0,095	0,784	1,178	2,132	15,829
4	0,044	0,062	0,807	1,136	2,267	9,831
5	0,058*	0,092**	1,100*	1,308	2,015	11,653
1	0,079*	0,127*	2,418*	1,168	2,214	14,602
2	0,075	0,158	2,277	1,493	2,234	12,208
3	0,044	0,048	0,403	1,261	2,041	15,848
4	0,082	0,127	1,496	1,499	2,280	18,040
5	0,054	0,078	0,748	1,166	2,542	21,073
6	0,053	0,083	0,769	1,202	1,987	9,806
7	0,054	0,142	0,622	1,194	2,099	10,942
8	0,027	-0,027	0,990	1,067	2,378	8,213
9	0,064	0,121	1,182	1,442	1,795	9,149
10	0,055*	0,068*	1,049*	1,190	2,265	14,540

* %10 significiance level, ** %5 significiance level,*** %1 significiance level.

It is accepted by users of accounting information that earnings with high continuity are sustainable, less temporary and more stable. For this reason, it can be stated that firms with high earnings persistence, that is, high β value, have more permanent earnings. A statistically significant difference was found between the ROA, ROE and EPS averages in the second and third groups, which were divided into 20% and 10% groups according to the earnings persistence.

The difference obtained can be interpreted as that firms with high earnings persistence have higher return on assets, return on equity and earnings per share compared to firms with low earnings persistence.

The higher the predictability number obtained in the profit predictability model, the less the ability to predict earnings. This situation causes a decrease in accounting information quality. Therefore, it can be conducted that there is a negative relationship between predictability and accounting information quality. Due to the expected negative relationship, the companies in the study group were ranked from small to large according to the predictability of profit.

Table 8. Firm Performance and Firm Value by Earnings Predictability Measure

	Firm Performance			*Firm Value*		
	ROA	*ROE*	*EPS*	*Tobin Q*	*M/B*	*P/E*
1	*0,055**	*0,092*	*0,909**	*1,369*	*2,374****	*19,225****
2	*0,057*	*0,090*	*0,833*	*1,242*	*2,289*	*15,643*
3	*0,048*	*0,075*	*1,202*	*1,252*	*2,298*	*12,278*
4	*0,074**	*0,112*	*1,821**	*1,207*	*1,775****	*6,694****
1	*0,055***	*0,108*	*0,781***	*1,361*	*2,263***	*21,170****
2	*0,066*	*0,105*	*1,162*	*1,194*	*2,181*	*13,828*
3	*0,037*	*0,030*	*0,670*	*1,368*	*2,542*	*13,628*
4	*0,057*	*0,109*	*1,330*	*1,216*	*2,163*	*13,073*
5	*0,078***	*0,109*	*2,008***	*1,199*	*1,775***	*5,603****
1	*0,051****	*0,116*	*0,747***	*1,405*	*2,467***	*23,053****
2	*0,060*	*0,103*	*0,832*	*1,317*	*2,089*	*19,254*
3	*0,054*	*0,078*	*1,222*	*1,214*	*2,536*	*13,031*
4	*0,077*	*0,131*	*0,933*	*1,146*	*1,793*	*14,532*
5	*0,039*	*0,032*	*0,634*	*1,439*	*2,755*	*17,305*
6	*0,038*	*0,035*	*0,871*	*1,292*	*2,248*	*9,989*
7	*0,066*	*0,136*	*1,679*	*1,270*	*2,623*	*15,171*
8	*0,048*	*0,083*	*0,983*	*1,181*	*1,742*	*11,049*
9	*0,054*	*0,061*	*0,629*	*1,221*	*1,816*	*6,477*
10	*0,100****	*0,155*	*3,426***	*1,180*	*1,745***	*4,722****

* %10 significiance level, ** %5 significiance level,*** %1 significiance level.

When the findings reported in Table 7 are examined, statistically significant differences were found between the groups with the lowest earnings predictability 25%, 20% and 10% and the groups with the highest predictability between the ROA and EPS averages. In addition, it is observed that there is a significant difference between the averages of M/B and P/E ratios between the firms with the lowest predictability of 25%, 20% and 10% and the highest predictability.

7. DISCUSSION AND CONCLUSION

It can be stated that as the information quality of accounting increases, firm performance and firm value of firms in the review period will increase. It has been determined that the accrual-based accounting information quality indicators (Jones and MJones) have a positive effect on the return on assets and price to earnings ratios of firms. It can be argued that as firms avoid accrual-based manipulation practices, their return on assets and price to earnings ratios increase. No significant findings were found between revenue manipulation (Stubben model) and firm performance and firm value indicators. It was determined that Francis model, where the accounting information quality was obtained by taking the standard deviation of the earnings from the mean, had a positive effect on return on assets, Tobin's Q and market to book value ratios.

In case firms' profit amounts are closer to the average profit amounts (Francis model), it can be evaluated within the scope of and working constraints that firms' return on assets, Tobin Q and market to book value will be higher. On the other hand, it has been determined that as firms' efforts to stabilize their profit amounts decrease, in other words, their efforts to smooth their profit amounts, firms' return on assets, return on equity, earnings per share, Tobin Q and market value / book value ratios will increase. It is evaluated that firms' reporting of real profit amounts has a positive effect on firm performance and firm value indicators. Moreover, it can be stated that firms with more persist earnings have more positive return on assets, return on equity and earnings per share indicators. In addition, as the earnings predictability increases, firms' market to book value and price to earnings ratios increase.

In this direction, firms' having better quality accounting information by avoiding manipulation methods will increase their reliability in the market and increase firm performance and value. In addition, the fact that firms have quality accounting information will enable the users of accounting information to make healthier decisions. On the other hand, it is important for companies to have a policy of providing higher quality information in order to have a wider investor portfolio and to meet their additional financing needs. For this reason, companies are required to report accurate and reliable accounting information, indicating their actual status.

The study has some limitations. The study is limited to manufacturing companies traded in Borsa Istanbul and operating continuously between 2005 and 2017. Other sectors are excluded in terms of reporting and legislative differences.

Another limitation is the International Accounting Standards, which started to be implemented in Turkey in 2005, so the review period was started in 2005. The reason for this is that the study is freed from the effects of different accounting practices. In addition, it should be taken into account that there are models that evaluate information quality from different perspectives, apart from the models selected as an indicator of accounting information quality.

The use of more observation periods in future studies will enable a more detailed examination of the accounting information quality relations. It has been evaluated that the construction of these relations in a way that examines the differences between countries and sectors will contribute to the literature. In addition, using indicators other than firm performance and firm value indicators used in the study, the relationships with information quality can be examined from different perspectives.

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