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RESEARCH ARTICLE
Accounting

Detection of the Relationship Between Firm Age and Discretionary Accrual Manipulation Practices: Evidence From BIST

Firma Yaşı ve İhtiyari Tahakkuk Manipülasyonu Arasındaki İlişkinin Tespit Edilmesi: BIST Örneği

Ömer Faruk Büyükkurt [1]

ABSTRACT

This study examines the relationship between firm age and discretionary accrual manipulation in manufacturing firms listed on BIST (Borsa Istanbul) from 2013 to 2019. By applying stringent data selection criteria, the final sample includes 1,063 firm-year observations drawn from various manufacturing sub-sectors. Discretionary accruals, detected via the Dechow Model, serve as the study's dependent variable. To ensure a comprehensive analysis, several control variables are incorporated: financial leverage, firm size, return on assets (ROA), and market-to-book ratio. These controls are essential to isolate the effect of firm age on accrual manipulation practices. Additionally, year-specific and sub-sector-specific dummy variables are utilized to account for temporal and industry-related variations that may impact the levels of discretionary accruals. The methodological framework employs a fixed-effect panel data multiple linear regression model. This choice is validated through the application of the Breusch-Pagan Lagrange Multiplier (LM) Test and the Hausman Test, which confirmed the fitness of the fixed-effects approach over alternative models. The empirical findings of the study reveal a significant inverse relationship between firm age and discretionary accrual manipulation. Specifically, the results suggest that older firms are less likely to engage in such practices, potentially due to their established reputations and more robust internal controls. Furthermore, the study finds that larger firms and firms those with higher performance metrics, as measured by return on assets, also exhibit significant impacts on income-increasing discretionary accrual manipulation. These insights contribute to the existing literature by highlighting the influence of firm age, size, and performance on earnings management practices within the manufacturing sector. The findings have practical implications for investors, regulators, and policymakers aiming to enhance the transparency and reliability of financial reporting.

Keywords: Financial Accounting, Accrual Manipulation, Firm-Age

ÖZET

Bu çalışma, 2013 ile 2019 yılları arasında BIST (Borsa İstanbul) üzerinde listelenen imalat firmalarında şirket yaşı ile isteğe bağlı tahakkuk manipülasyonu arasındaki ilişkiyi incelemektedir. Veri seçim kriterleri uygulandıktan sonra, nihaî örneklem çeşitli imalat alt sektörlerinden elde edilen 1.063 firma-yıl gözleminden oluşmuştur. Dechow Modeli aracılığıyla tespit edilen isteğe bağlı tahakkuklar, çalışmanın bağımlı değişkeni olarak kullanılmıştır. Şirket yaşının tahakkuk manipülasyonu üzerindeki etkisini izole etmek için finansal kaldıraç, firma büyüklüğü, aktif karlılığı (ROA) ve piyasa-defter değeri oranı kontrol değişkenleri çalışmaya dahil edilmiştir. Ayrıca, isteğe bağlı tahakkuk seviyelerini etkileyebilecek zaman ve sektörle ilgili varyasyonları hesaba katmak amacıyla, yıl ve alt sektör bazında kukla değişkenler kullanılmıştır. Çalışmada, sabit etkili panel veri çoklu doğrusal regresyon analizi uygulanmıştır. Bu tercih, Breusch-Pagan Lagrange Çarpanı (LM) Testi ve Hausman Testi uygulanarak doğrulanmış ve sabit etkiler yaklaşımının alternatif modellere kıyasla daha uygun olduğu tespit edilmiştir. Çalışmanın bulguları, firma yaşı ile isteğe bağlı tahakkuk manipülasyonu arasında önemli bir negatif ilişki olduğunu ortaya koymaktadır. Bu durum, görece yaşı daha fazla olan firmaların sektörel itibarları ve daha sağlam iç kontrol mekanizmalarının bir sonucu olarak ortaya çıkmış olabilir. Ayrıca, firma büyüklüğü ve aktif karlılığı ile gelir artırıcı isteğe bağlı tahakkuk manipülasyonu arasında anlamlı etkileşim gözlemlenmiştir.

Anahtar Kelimler: Finansal Muhasebe, Tahakkuk Manipülasyonu, Firma-Yaşı

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INTRODUCTION

Earnings manipulation, particularly through the manipulation of discretionary accruals, can obscure the true financial health of the firms. Thus, understanding the determinants and implications of discretionary accrual manipulation is crucial for existing and prospect stakeholders of the firms. Although, the number of studies on discretionary earnings manipulation has still been increasing, dynamics and determinants of managers' discretions over accrual transactions still attracting the interest of researchers. Arguably, firm age is relatively less investigated element of discretionary accrual manipulation. Due to these reasons, this study aims to shed light on the relationship between firm age and the manipulation of discretionary accruals, focusing on manufacturing firms listed on Borsa Istanbul (BIST) for the period spans between 2013 and 2019. The scope of the study encompasses analysis of 1,063 firm-year observations, selected from the various sub-sectors of the manufacturing industry. The number of firm-year observations is relatively low comparing with the raw sample because of the strict selection and data-cleaning procedure. The selection criteria, which are explained in detail at methodology section, were rigorously applied to ensure the reliability and relevance of the data.

[1] Assit. Prof. Dr., Erzincan Binali Yıldırım University, Faculty of Economics and Administrative Sciences, Department of Finance and Banking, Erzincan, Türkiye.

The primary variable of interest in the study is discretionary accruals, which is quantified using the Dechow model, a well-regarded method in the accounting literature for detecting abnormal accruals. This variable serves as the dependent variable in our analysis. To provide a robust examination of the factors influencing discretionary accrual manipulation, several control variables are incorporated into the study. These include financial leverage, firm size, return on assets (ROA), and market-to-book ratio, each chosen for their documented influence on earnings management practices. Additionally, year-specific and sub-sector-specific dummy variables are employed to account for temporal and industry-related variations that may affect the levels of discretionary accruals.

The methodological framework of this research is grounded in fixed-effect panel data multiple linear regression analysis. This approach was selected following the application of the Breusch-Pagan Lagrange Multiplier (LM) Test and the Hausman Test, which indicated the aptness of methodology of fixed-effects model over alternative specifications. This rigorous statistical methodology ensures that the findings are robust and reliable.

The empirical results of the study reveal a significant inverse relationship between firm age and the manipulation of discretionary accruals. Specifically, older firms are found to engage in significantly less discretionary accrual manipulation compared to their younger counterparts. This finding is consistent with the hypothesis that older firms, with their established reputations and presumably more sophisticated internal controls, are less inclined to engage in such manipulative practices. Additionally, the study finds that larger firms and firms with healthier measures of performance, such as higher return on assets, are more probable to engage in income-boosting discretionary accrual manipulation.

The findings of this study have several important practical implications. For investors, the negative association between firm age and discretionary accrual manipulation suggests that older firms may present more reliable financial statements, potentially serving as a safer investment option. For regulators and policymakers, understanding the dynamics of earnings management across different firm ages can inform the development of targeted regulatory frameworks to curb manipulative accounting practices. Furthermore, for corporate managers and auditors, the insights gained from this study can help in designing more effective internal controls and auditing procedures to uncover and prevent earnings management, thereby enhancing the overall transparency and integrity of financial reporting. In conclusion, this study adds to the current literature of accounting by providing a in depth understanding of how firm age influences discretionary accrual manipulation, with broader implications for various stakeholders in the financial reporting ecosystem.

Rest of the paper is organized as follows: literature review is followed by hypotheses, then the methodology & sample section discusses the sample selection criteria and the methodology specification process. The following section presents the results together with discussion of them. Final chapter is conclusion.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT:

A considerable and increasing body of literature has scrutinised the discretionary accrual manipulation and its determinants. One of the determinants that has been considered by researchers is firm-age. There are numerous studies investigated age and its effects on discretionary accruals either directly or indirectly. Some researchers put firm-age on the focuses of their studies, while some others use firm-age as control variable.

The life-cycle theory suggests that firms experience various stages, roughly categorized as; growth, maturity, and decline, and each of these stages are characterized by distinct financial behaviours and managerial incentives. For instance, Gort and Klepper (1982) suggest five stages: “Introduction, Growth, Maturity, Shake-out, and Decline”. Alternatively, Miller and Friesen (1984) suggested a five different stages: “Birth, Growth, Maturity, Revival, Decline”. Dickinson (2011), also, argued that life-cycle stages of the firms contain some particular implications about the comprehending their financial performances.

It has been documented in the literature that early stage firms are generally poor regarding their quality of financial statements. Krishnan et al. (2021) expanded on the study of the various phases of the firm life cycle by investigating if information quality changes throughout these phases. They assessed quality of financial statements by considering the possibility of “material misstatements in financial statements” because of internal control weaknesses. Their findings indicated that quality of financial reports was inferior throughout the stages of introduction, growth, and decline, and higher across the mature phase. Amongst different stages of life cycles, mature stage firms typically engage less in earnings management because they tend to have established reputations and a stronger awareness of the codes and ethics governing their operations (Bassiouny et al., 2016). Younger companies rely more on achieving higher earnings growth to demonstrate better performance compared to older companies (Das, Mishra, and Rajib, 2018). Increasing reported earnings allows managers to establish a stronger foundation for forecasting prospect incomes (e.g., Asnaashari and Mahdi 2017), indicating a greater potential for the firm to demonstrate improved performance in the future (Jaggi et al. 2022). In fact, Jaggi et al (2022) found their study that, early stage firms implement income increasing discretionary accrual management, whereas this is not observed in mature stage firms.

To sum up, the literature indicates that younger firms, typically in the growth phase, may face higher uncertainty and pressure to demonstrate profitability, potentially increasing their propensity to engage in discretionary accrual manipulation to attract investors and to signal about the future performance of the firms. Conversely, mature firms, having established a stable market presence and reputation might intimidate the managers to implement earnings management practices.

The studies that particularly investigates the relationship between firm-age and discretionary accrual management found similar results with the studies that scrutinized the association between life-cycle characteristics of the firms and their earnings manipulation exercises. Stubben (2010) investigated the discretionary part of the revenues as the proxy of earnings manipulation and he included firm-age in his model. He found that there is a negative and significant relation between firm-age and earnings manipulation. Bouaziz et al. (2020) employed three different models in their study that investigates the CEO features and earnings manipulation in the context of France. Results of all three model indicate that there is a negative and significant relationship between firm-age and discretionary accrual management. Similarly, Xiong (2016) investigated the association between chairman characteristics and earnings manipulation. It is found that there is a negative and significant relation between firm-age and earnings manipulation. Liu et al. (2018) utilized variable of firm-age in their studies and investigates the earnings management amongst Korean firms. They also found negative association between firm-age and discretionary accrual manipulation.

Under the light of the literature, following hypothesis are developed.

H0: There is a negative relationship between firm-age and discretionary accrual manipulation.

H1: There is not a negative relationship between firm-age and discretionary accrual manipulation.

Following section explains the sample selection procedure and the methodology of the study.

SAMPLE SELECTION & METHODOLOGY:

SAMPLE SELECTION:

Sample of the study was drawn from Borsa Istanbul (BIST) for the period spans between 2013 and 2019. The study period is restricted in 7 years due to removing the distorting effects of 2008 financial crisis (and its years-long aftermaths) and COVID-19 pandemic on the financial statements. Table-1 presents the sample selection process.

Table 1: Sample Formation Process

Initial sample size	*2,466 firm year-observations*
After cleaning missing variables	*1,794 firm year-observations*
After dropping sub-sectors that have insufficient number of observation for the analysis	*1,603 firm year-observations*
Number of unique firms in the final sample	*201*

Sample selection process starts with all manufacturing firms of the period. Initial sample-size was 2,466 firm-year observation. After cleaning missing variables, the sample size dropped to 1,794. Once the missing variables are cleaned, the number of firm-year observations for some sub-sectors declines to a level that prevents them from being analysed properly. After cleaning these sub-sectors, final sample size dropped to 1,603 firm-year observation from 201 unique firms.

METHODOLOGY:

The methodological approach of this study involves a fixed-effect panel data multiple linear regression model. This model is chosen to control for unobserved heterogeneity across firms, which could bias the results if not properly accounted for. The fixed-effects model is particularly suited for this analysis as it allows for controlling time-invariant characteristics of the firms that could influence discretionary accrual practices.

The selection of the fixed-effects model is validated through the application of two diagnostic tests: the Breusch-Pagan Lagrange Multiplier (LM) Test and the Hausman Test. The Breusch-Pagan LM Test is employed to determine whether a random-effects model is appropriate, while the Hausman Test compares the fixed-effects model with the random-effects model. The results from these tests confirmed that the fixed-effects approach is more suitable for this study, ensuring that the model accurately captures the relationship between firm age and discretionary accrual manipulation without the biases associated with time-invariant unobserved heterogeneity.

The primary variable of interest in this study is discretionary accruals, which are detected using the Dechow Model. This model was constructed on Jones Model (1991) and widely recognized in the accounting literature for its effectiveness in identifying abnormal accruals, making it a suitable choice for this research. Discretionary accruals serve as the dependent variable, representing the extent of earnings manipulation practices by firms.

To isolate the effect of firm age on discretionary accrual manipulation, several control variables are incorporated into the analysis. These include financial leverage, firm size, return on assets (ROA), and market-to-book ratio. Financial

leverage is included to account for the impact of debt levels on a firm's financial reporting decisions. Firm size is considered because larger firms may have more resources and sophisticated internal controls, potentially influencing their accrual practices. ROA is used to measure firm performance, as higher performance could correlate with different incentives for earnings management. The market-to-book ratio is included to capture market perceptions of firm value, which might affect managerial behaviour regarding accruals.

Additionally, year-specific and sub-sector-specific dummy variables are utilized to control for temporal and industry-related variations that may influence discretionary accrual levels. Year dummies help account for macroeconomic conditions and regulatory changes over the study period, while sub-sector dummies control for differences in industry practices and competitive environments.

Equation-1 is utilized to estimate the coefficient values, which are then used in Equation-2 to determine the non-discretionary portion of the total accruals for each firm-year combination.

$$\frac{TACC_{it}}{TA_{it-1}} = \alpha_0 + \beta_1\left(\frac{1}{TA_{it-1}}\right) + \beta_2\left(\frac{\Delta Sales_{it} - \Delta REC_{it}}{TA_{it-1}}\right) + \beta_3\left(\frac{PPE_{it}}{TA_{it-1}}\right) + \varepsilon_{it} \qquad \text{Equation -1}$$

Additionally, year-specific and sub-sector-specific dummy variables are utilized to control for temporal and
Where;
$TACC_{it}$: Total accruals, which is earnings before extraordinary items subtracted from CFO
REC_{it}: Difference in account receivables from year t-1 to t,
$Sales_{it}$: Difference in sales from year t-1 to t
PPE_{it}: Property plant and equipment, and,
TA_{it-1}: Total asset from the beginning of the period t.

The estimated coefficients in Equation-1, which are presented as "hats" atop them, substituted in Equation (2) below.

$$\frac{NONACC_{it}}{TA_{it-1}} = \widehat{\alpha_0} + \widehat{\beta_1}\left(\frac{1}{TA_{it-1}}\right) + \widehat{\beta_2}\left(\frac{\Delta Sales_{it} - \Delta REC_{it}}{TA_{it-1}}\right) + \widehat{\beta_3}\left(\frac{PPE_{it}}{TA_{it-1}}\right) + \varepsilon_{it} \qquad \text{Equation-2}$$

Where;

$NONACC_{it}$: Non-discretionary accruals.

The rest of the variables are already described above after Equation-1.

By executing Equation-2 for each firm-year, we derive the non-discretionary accruals for each firm-year. Subsequently, the calculation outlined in Equation-3 is employed to determine the amount of discretionary accruals for each firm-year. Where;

$$DISACC_{it} = TACC_{it} - NONACC_{it} \qquad \text{Equation-3}$$

Where;

$DISACC_{it}$: The level of discretionary accruals for each firm-year in the sample is determined by subtracting the non-discretionary accruals, calculated using Equation-2, from the total accruals generated in Equation-1 for each firm-year.

$$ADA_{i,t} = \alpha_0 + \beta_1 SIZE_{i,t} + \beta_2 MTB_{i,t} + \beta_3 ROA_{i,t} + \beta_4 LEV_{i,t} + \beta_5 AGE + e_{i,t} \qquad \text{Equation-4}$$

ADA_{it} : Abnormal level of discretionary accrual earnings manipulation obtained via Equation-3,
$SIZE_{it}$: Natural logarithm of market capitalization,
MTB_{it} : Market-to-Book ratio,
ROA_{it} : Return-on-asset calculated as net income scaled by average total equity,
LEV_{it} : Financial leverage of the firm calculated as total assets scaled by total equity,
AGE_{it} : Number of years passed since the founding year of the firm.

Following section presents the results and discussion of the study.

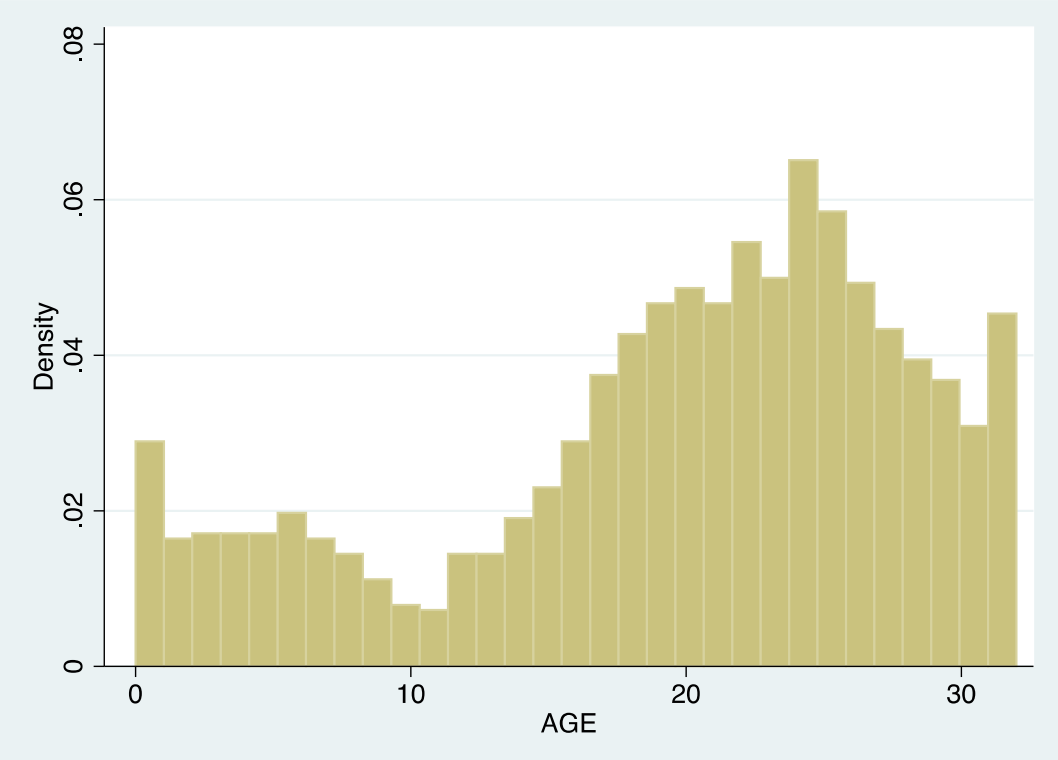
RESULTS & DISCUSSION:

In this section results and discussion are provided. Table-2 provides a summary of the descriptive statistics of key variables employed in the study.

Table 2: Descriptive Statistics

Variables	Mean	Std. Dev.	Minimum	Median	Maximum
ADA	0.000137	0.10795	-0.5207	-0.00203	0.4644
SALETAL	0.8591	0.6041	0.0049	0.7684	11.4321
SIZE	12.5185	1.9326	7.2723	12.5208	18.1751
MTB	2.4898	5.5725	0.73	1.4	33.31
ROA	6.4083	9.6944	-25.56	6.24	36.48
LEV	2.7914	3.3696	0.9674	2.0703	26.3304
AGE	19.5033	8.2752	0	21	32

The descriptive statistics for ADA (abnormal discretionary accruals) indicate that the mean value is 0.000137, suggesting that, on average, the abnormal discretionary accruals are very close to zero. This points to a balance between positive and negative accruals in the dataset. The standard deviation is 0.10795, which signifies a relatively wide spread of values around the mean, indicating considerable variability in the abnormal discretionary accruals. The median value of -0.00203 shows that half of the observations lie below this value, highlighting that a slight majority of the accruals are negative. For SALETAL (Sales scaled by lagged total assets), the mean value is 0.8591, indicating that, on average, sales are approximately 85.91% of the lagged total assets. Regarding SIZE (Log market capitalization), the mean value is 12.5185, which reflects the average log-transformed market capitalization of the firms in the dataset. The standard deviation of 1.9326 indicates a wide range of market capitalizations, suggesting that the size of firms varies considerably. LEV (Total assets scaled by equity) has a mean value of 2.7914, indicating that, on average, firms have total assets that are approximately 2.79 times their equity. The standard deviation of 3.3696 suggests a high level of variability in the leverage ratios among firms. AGE (The number of years since the foundation of the firm) has a mean value of 19.5033, indicating that, on average, firms in the dataset have been in existence for about 19.5 years. The standard deviation of 8.2752 suggests some variation in the ages of the firms, but generally, they tend to be relatively mature. The minimum value of 0 indicates that there are very young firms in the dataset, while the median value of 21 suggests that half of the firms are 21 years old or younger, showing a slightly higher concentration of firms around this age.



Graph 1: Histogtam distribution graph of firm-ages.
Source: Generated by the author.

Graph-1 above presents the histogram distributions of the number of firm-ages of the firm-years in the sample. X and Y-axis of the graph represents the firm-ages the density of each firm-age of the sample respectively. As it can be seen in the graph that the highest number of firm-age in the observation fall into age 24, with a density of slightly higher than 6%, and the lowest number of the firm-age observation belongs to age 11, with density of less than 1%.

Table 3: Correlation Matrix

	ADA	TA	SALETAL	SIZE	MTB	ROA	LEV	AGE
ADA	1.000							
TA	-0.066	1.000						
SALETAL	-0.073*	0.954*	1.000					
SIZE	0.080*	0.575*	0.114*	1.000				
MTB	-0.001	-0.042	0.086*	0.195*	1.000			
ROA	0.256*	0.059	0.255*	0.379*	0.102*	1.000		
LEV	-0.024*	0.033	0.035	-0.057	0.494*	-0.116*	1.000	
AGE	-0.051*	0.170*	0.075*	0.426*	0.126*	0.158*	0.036	1.000

Table-3 presents the correlations matrix among the eight key inputs employed in the study. There is a significant negative correlation between firm age and abnormal discretionary accruals (ADA) (-0.051). This suggests that older firms tend to have slightly lower levels of abnormal discretionary accruals. The correlation between firm age and total asset (TA) is positive and significant (0.170). This indicates that older firms tend to have more total assets. There is a significant and positive correlation between firm age and sales scaled by lagged total assets (SALETAL) (0.426). This means that older firms tend to have higher sales. The correlation between firm age and firm size is also positive and significant (0.426). This suggests that older firms are generally larger in size. There is a positive correlation between firm age and the market-to-book ratio (MTB) (0.126), which is statistically significant. This implies that older firms tend to have a slightly higher market-to-book ratio. The relationship between firm age and return-on-assets (ROA) is positive and significant (0.158), which indicates that older firms tend to have slightly better performance as measured by ROA. Lastly, the correlation between firm age and financial leverage (LEV) is positive yet insignificant (0.036). This suggests that there is no meaningful relationship between firm age and leverage.

Table 4: Regression Results

Variable	Coefficients	p-values
SIZE	0.11410**	0.034
MTB	-0.00146	0.275
ROA	0.00449***	0.000
LEV	-0.05301*	0.067
AGE	-0.00833***	0.000
YEAR DUMMY	YES	
SUB-INDUST. DUMMY	YES	
Adj-R Square	0.1217	
Obs.	1,603	

Table-4 presents the results of Equation-4. As shown in the table, the sample size consists of 1,603 firm-year observations. The dependent variable, ADA, stands for the abnormal level of discretionary accruals, capturing the discretionary accrual manipulation tendencies of the sample firms. The independent variables include SIZE, MTB, ROA, LEV, and AGE. The model also incorporates year dummy and sub-industry dummy variables to account for their potential effects on the level of abnormal accruals. The adjusted R-squared value is 12.17%, which aligns with the findings in the literature. In terms of specific findings, the coefficient for SIZE is positive and significant, with a value of 0.11410 at the 5% significance level and a p-value of 0.034. This suggests that larger firms tend to have higher levels of abnormal discretionary accruals, indicating a greater propensity for earnings manipulation as firm size increases. Conversely, the coefficient for the market-to-book ratio (MTB) is negative but not statistically significant, at -0.00146 with a p-value of 0.275. This indicates that there is no robust evidence of a relationship between the market-to-book ratio and abnormal discretionary accruals in this sample. The coefficient for return on assets (ROA) is positive and highly significant, with a value of 0.00449 at the less than 1% significance level, as indicated by a p-value of 0.0000. This strong positive relationship implies that firms with higher profitability, as measured by ROA, are more likely to engage in discretionary accrual manipulation. The coefficient for leverage (LEV) is negative and significant at the 10% level, with a value of -0.05301 and a p-value of 0.067. This suggests that firms with higher leverage are associated with lower levels of abnormal discretionary accruals, indicating that debt might act as a constraint on earnings manipulation. Lastly, the coefficient for AGE is negative and highly significant, recorded at -0.00833 at the less than 1% significance level, with a p-value of 0.0000. This strong inverse relationship indicates that older firms are less likely to engage in discretionary accrual manipulation, potentially due to their established reputations and more sophisticated internal controls. Overall, these findings provide important insights into the factors influencing discretionary accrual manipulation, highlighting the roles of firm size, profitability, leverage, and age.

CONCLUSION

This study offers a comprehensive analysis of the relationship between firm age and the manipulation of discretionary accruals, focusing specifically on manufacturing firms listed on Borsa Istanbul (BIST) from 2013 to 2019. By examining 1,063 firm-year observations through a rigorous selection and data-cleaning process, the research provides robust insights into how discretionary accrual manipulation varies with firm age and other

influencing factors. The findings reveal a significant inverse relationship between firm age and the manipulation of discretionary accruals, indicating that older firms are less likely to engage in such manipulative practices compared to younger firms. This supports the hypothesis that established firms, with their stronger reputations and more sophisticated internal controls, have less incentive to manipulate earnings. Moreover, the study highlights that larger firms and those with higher performance metrics, such as return on assets, tend to engage more in income-increasing discretionary accrual manipulation. The implications of these findings are multifaceted. For investors, the research suggests that older firms may provide more reliable financial statements, making them potentially safer investment choices. Regulators and policymakers can use these insights to develop targeted regulations aimed at reducing earnings manipulation, particularly focusing on younger firms that are more prone to such practices. Corporate managers and auditors can also benefit from these findings by enhancing internal controls and auditing procedures to better detect and prevent earnings manipulation, thereby improving the overall transparency and integrity of financial reporting.

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