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The Estimation of Income Smoothing on BIST 100 Index*

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ABSTRACT

The purpose of this paper is to estimate the income smoothing degrees of the largest manufacturing companies traded in Borsa Istanbul under the subject of accrual-based earnings management. Using the model of Tucker and Zarowin (2006),the correlations between the change in discretionary accruals and the change in un-managed income are calculated for each company between the years 2010-2017. As a result of the research, it is found that most of the companies have more negative correlation values which is the evidence of higher income smoothing. The firms in "metal goods, machinery and equipment" sector have higher income smoothing degrees, whereas the firms in "food, beverage and tobacco" sector are at the end of the list.

Keywords: *Income smoothing, accrual-based earnings management, discretionary accruals*

Jel Classification: *C35*

Borsa İstanbul 100 Endeksinde Kâr Düzleştirmesinin Değerlendirmesi

ÖZET

Bu araştırmanın amacı; Borsa İstanbul'da işlem gören en büyük imalatçı firmaların, tahakkuk esaslı kâr yönetimi başlığı altında kâr düzleştirme derecelerini tahmin etmektir. Tucker ve Zarowin (2006) modelini kullanarak, isteğe bağlı tahakkuklardaki değişiklik ile yönetilmeyen gelirdeki değişiklik arasındaki korelasyon 2010-2017 yılları arasında her şirket için hesaplanmıştır. Araştırma sonucunda, şirketlerin çoğunun daha yüksek kâr düzleştirmenin kanıtı olan daha fazla negatif korelasyon değerine sahip olduğu bulunmuştur. "Metal eşya, makine ve teçhizat" sektöründeki firmalar daha yüksek kâr düzleştirme derecelerine sahipken, "yiyecek, içecek ve tütün" sektöründeki firmalar listenin sonunda yer almaktadır.

Anahtar Kelimeler: *Kâr düzleştirmesi, tahakkuk esaslı kâr yönetimi, isteğe bağlı tahakkuklar*

Jel Sınıflandırması: *C35*

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1. INTRODUCTION

Starting in 2005, nowadays the listed companies in more than 100 countries are required to report their financial statements according to International Financial Reporting Standards (IFRS). The main purpose of these standards is to provide comparable financial statements that contain useful information globally. Direct IFRS advantages for investors are that IFRS ensure more accurate, comprehensive and timely financial statement information than the national standards. The international standards reduce the risk of small investors because all financial information users can reach the qualified information easily. They increase the efficiency by reducing the cost of processing financial information (Ball, 2006: 11).

The positive effects of the International Financial Reporting Standards on accounting information quality have been proven by a number of research studies all around the world.However, there might be unfavorable results of using these accounting principles and standards. According to Ball (2006: 24), first of all, internationally uniform accounting rules are untested by experience or by a significant body of academic results. Secondly, the fair value accounting is a concern, particularly in less developed nations. Also, there will be differences in financial reporting quality of different nations because the incentives of preparers and enforcers (such as auditors, courts, regulators, politicians) remain primarily local. Furthermore, by taking advantage of the flexibility of accounting principles and standards, some accounting manipulations are aimed to influence the perceptions about the business performance and financial structure standards (Demir and Bahadir, 2007: 105).

In order to increase stock price and market value of the company and to decrease cost of debit, income smoothing is used as a tool of earnings management.

While decreasing the fluctuations of a company profits between successive years, the perception of the market and stakeholders about the company can be changed by income smoothing. As a practice of income smoothing; in order to balance the profits each year, the profits which are generally considered as good in terms of their activities, are transferred to the years that can be considered as worse; and it is tried to create an impression that the profits of the companies are following a stable trend and the risk of the company's profitability is low (Yel and Erdem, 2016: 59). One of the important ways to reduce the variability of the reported profits isto adjust the timing of certain events by using the accruals.

Accrual-based earnings management is the process of reducing or increasing the profit due to the use of the accounting choices or discretionary powers performed by the executives under Generally Accepted Accounting Principles and Standards by using their flexibility (Onder and Agca, 2013: 36).

2. METHODOLOGY

Accrual basis accounting is considered as a system that makes adjustments on the amount of earnings by using the experience and knowledge advantages of the managers in order to estimate the future cash flows and eliminate the errors and deficiencies in the cash flows of the period (Luo, 2007: 13).

Accruals are classified as discretionary accruals and non-discretionary accruals based on the control of management; and short-term accruals and long-term accruals according to their periods (Teoh and Wong, 1998: 66). In order to reduce the variability in the reported profits, managers can adjust the timing of events and discretionary ratios on accruals under the name of earnings management.

In our study, we measure the income smoothing tendency of the companies in Turkey by using the model of Tucker and Zarowin in 2006.

Income Smoothing Measurement

The income smoothing is measured by the negative correlation between the change in discretionary-accruals proxy (ΔDAP) and the change in pre-discretionary income (ΔPDI). This measure assumes that there is an underlying pre-managed income series, and that managers use discretionary accruals to make the reported series smooth. More income smoothing is evident in a more negative correlation between ΔDAP and ΔPDI (Tucker and Zarowin, 2006: 254). In other words, it is expected that if the pre-discretionary income increases, the firm management prefers to use negative discretionary accruals in order to smooth the income.

In order to estimate discretionary accruals, the regression model of Tucker and Zarowin (2006: 254) that is the cross-sectional version of the Jones (1991: 211) model, modified by Kothari et al. (2001):

$$Accruals_{it} = \alpha_0 (1/Assets_{it-1}) + \alpha_1 \Delta Sales_{it} + \alpha_2 PPE_{it} + \alpha_3 ROA_{it} + \varepsilon_{it} \quad (1)$$

In the regression model (1), the values in year t for firm i, are stated below:

Accruals : (Net Income - Operating Cash Flows) / Total $Assets_{t-1}$
$Assets_{t-1}$: Total assets at the beginning of year t
ΔSales : ($Sales_t$ - $Sales_{t-1}$) / Total $Assets_{t-1}$
PPE : Gross Property, Plant and Equipment / Total $Assets_{t-1}$
ROA : Net Income / Total $Assets_{t-1}$

Non-discretionary accruals (NDAP) of firm i are represented by the fitted values of regression (1):

$$NDAP_{it} = \alpha_0 (1/Assets_{it-1}) + \alpha_1 \Delta Sales_{it} + \alpha_2 PPE_{it} + \alpha_3 ROA_{it} \quad (2)$$

Discretionary accruals (DAP) are the deviations of actual accruals from NDAP.

$$Accruals = DAP + NDAP \quad (3)$$

Pre-discretionary (un-managed) income (PDI) is the remaining value of subtracting DAP from net income. Both DAP and NI are deflated by the beginning of year total assets.

$$PDI = NI - DAP \quad (4)$$

The smoothing measure is estimated as the correlation between the change in discretionary accruals and the change in un-managed income: *Corr (ΔDAP, ΔDPI*). For each company, correlations are calculated by using the current year's and past five years' observations. Firms with more negative correlations are higher smoothing firms, whereas firms with less negative (or positive) correlations are lower smoothing firms.

Sampling and Data

For the estimation, 30 biggest manufacturing firms that are listed on Borsa Istanbul 100 Index (BIST 100) are determined.In terms of consistency of the data, the companies that are traded between the years 2010-2017without any interruption are chosen. The companies' annual financial data are collected from their own web sites separately. The year 2010 is considered as the base year, and 210 different observations are examined in order to make a comparison between the income smoothing degrees of the companies in terms of earnings smoothing and management.

3. RESULTS

The regression results of estimation discretionary accruals and income smoothing for biggest Turkish public manufacturing firms are shown in Table 1 and Table 2.

According to the Table 1, the considered regression is significant at 0.05level completely with a very small Significance F value. While it is compared with the previous studies of Tucker and Zarowin in 2006, and Li and Richie in 2016;adjusted R^2value is lower. The most important reason is that the observation number is much less than the other studies. The coefficients of the regression modelare in a same manner with the studies except the coefficient of $1/Assets_{t-1}$, but it is also very similar with the study of Moghadamet. al in 2013. Like the previous three studies, ROA has a positive significant relation with accruals with the smallest P-value.

Table 1. Estimation of discretionary accruals

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,53581538
R Square	0,28709812
Adjusted R Square	0,27318784
Standard Error	0,08476313
Observation	210

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	0,59315534	0,14828883	20,63927621	0,00000000
Residual	205	1,47288164	0,00718479		
Total	209	2,06603698			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-0,03915641	0,01621107	2,41541207	0,01659453	-0,07111821	-0,00719461
$1/Assets_{t-1}$	24586226,78	6948118,66	3,53854446	0,00049768	10887291,72	38285161,84
ΔSales	0,03675407	0,02940927	1,24974414	0,21281792	-0,02122936	0,09473749
PPE	-0,09707180	0,03009420	3,22559864	0,00146316	-0,15640562	-0,03773798
ROA	0,52297335	0,08001916	6,53560198	0,00000000	0,36520730	0,68073939

After obtaining the values of coefficients from regression (1) and fitting into the non-discretionary accruals equity (2), $NDAP_{it}$ values are calculated for each firm-year. Then, DAP_{it}values are found by using the equity (3). As the measure of income smoothing, pre-discretionary income (PDI_{it}) values are calculated by subtracting DAP_{it}values from net income (NI_{it}). At the end, the correlations between the change in discretionary accruals and the change in un-managed incomes of each company have been detected. In Table 2, the earnings smoothing correlation *Corr (ΔDAP, ΔDPI*) is -0,739 on average, with a median value of -0,899 which is very similar with the mean and median reported by Li and Richie (2016) of -0.731 and -0.922, and by also Tucker and Zarowin (2006) of -0.709 and -0.899.

Table 2 . Estimation of income smoothing

Variable	N	Mean	Median	Std. Dev.
DAP	210	-0,03916	-0,04354	-0,24723
Corr(ΔDAP, ΔPDI)	210	-0,73908	-0,89926	0,400745

In Table 3, the biggest 30 manufacturing public companies' correlation values between the change in discretionary accruals and the change in un-managed income are listed. On the top of the list, there is *OtokarOtomotiv,* which has been manufacturing buses for public transportation, semi-trailers for transportation and logistics industry and tracked armoured vehicles and tactical armoured vehicles for the defense industry, in *Metal Goods, Machinery & Equipment* sector with a very close value to -1. The company has the most negative correlation between ΔDAP and ΔPDI value which is the evident of the highest income smoothing. *Vestel Elektronik,* which is one of the top 3 white goods producers in Turkey, in the same sector follows it with a very similar correlation value. At the first 10 of the list, it is observed that more than half of the companies' sector is *Metal Goods, Machinery & Equipment*. Then, there are companies in *Chemicals, Petroleum Rubber & Plastic Products* on the top of the list.

50% of the sample has a Corr(ΔDAP, ΔPDI) value smaller than -0.9 which means the biggest manufacturing companies in Turkey has a tendency to smooth their earnings.

At the bottom of the list there are the companies in *Food, Beverage & Tobacco* sector. *Anadolu Efes,* which manufactures and sales beer and malt, is the lowest smoothing firm with 0,78 correlation value.

Table 3. Corr(ΔDAP, ΔPDI)of the Companies in Manufacturing Industrylisted on Borsa Istanbul 100 Index

No	Company Name	Company Sector (Manufacturing Industry)	Corr(ΔDAP, ΔPDI)
1.	Otokar Otom. ve Savunma San. A.Ş.	MetalGoods, Machinery&Equip.	-0,998866578
2.	Vestel Elektronik San. ve Tic. A.Ş.	MetalGoods, Machinery&Equip.	-0,988230214
3.	Kordsa Teknik Tekstil A.Ş.	Weaving, Clothing&Leather	-0,981398485
4.	Tüpraş-Türkiye Petrol Raf. A.Ş.	Chem. Petrol. Rubber&PlasticProd.	-0,975694741
5.	Türk Traktör ve Ziraat Mak. A.Ş.	MetalGoods, Machinery&Equip.	-0,969909234
6.	Tofaş Türk Otomobil Fabrikası A.Ş.	MetalGoods, Machinery&Equip.	-0,969031301
7.	Arçelik A.Ş.	MetalGoods, Machinery&Equip.	-0,964658462
8.	Sasa Polyester Sanayi A.Ş.	Chem. Petrol. Rubber&PlasticProd.	-0,958162674
9.	Ford Otomotiv Sanayi A.Ş.	MetalGoods, Machinery&Equip.	-0,95276073
10.	Soda Sanayii A.Ş.	Chem. Petrol. Rubber&PlasticProd.	-0,948873784
11.	Göltaş Göl. Böl. Çim. San. ve Tic. A.Ş.	Stone andSoilBased	-0,926811081
12.	Petkim Petrokimya Holding A.Ş.	Chem. Petrol. Rubber&PlasticProd.	-0,922890066
13.	Brisa Brid. Sabancı Lastik San. Tic. A.Ş.	Chem. Petrol. Rubber&PlasticProd.	-0,917261642
14.	Gübre Fabrikaları T.A.Ş.	Chem. Petrol. Rubber&PlasticProd.	-0,908264413
15.	İzmir Demir Çelik Sanayi A.Ş.	Metal Main Industry	-0,902972283
16.	Aygaz A.Ş.	Chem. Petrol. Rubber&PlasticProd.	-0,895553969
17.	Vestel Beyaz Eşya San. ve Tic. A.Ş.	MetalGoods, Machinery&Equip.	-0,882333513
18.	Banvit Bandırma Vit. Yem San. A.Ş.	Food, Beverage&Tobacco	-0,865850167
19.	Aksa Akrilik Kimya Sanayii A.Ş.	Chem. Petrol. Rubber&PlasticProd.	-0,863942701
20.	Kartonsan Karton San. ve Tic. A.Ş.	Paper&PaperProd. Print.&Broadcast	-0,849459304
21.	Ereğli Demir ve Çelik Fab. T.A.Ş.	Metal Main Industry	-0,810640318
22.	Karsan Otomotiv San.veTic. A.Ş.	MetalGoods, Machinery&Equip.	-0,789130932
23.	Kardemir Karabük Dem.Çel.San.Tic.A.Ş.	Metal Main Industry	-0,738570625
24.	Anadolu Cam Sanayii A.Ş.	Stone &SoilBased	-0,661243447
25.	Trakya Cam Sanayii A.Ş.	Stone &SoilBased	-0,558684731
26.	Bagfaş Bandırma Gübre Fab. A.Ş.	Chem. Petrol. Rubber&PlasticProd.	-0,544874698
27.	Coca-Cola İçecek A.Ş	Food, Beverage&Tobacco	-0,46255403
28.	Tat Gıda Sanayi A.Ş.	Food, Beverage&Tobacco	-0,043055797
29.	Ülker Bisküvi Sanayi A.Ş.	Food, Beverage&Tobacco	0,296360953
30.	Anadolu Efes Bira. ve Malt San. A.Ş.	Food, Beverage&Tobacco	0,783022784

4. CONCLUSION

In this research, income smoothing estimation of the manufacturing companies listed on BIST 100 index is evaluated. The results indicate that most of the companies have more negative correlations between the change in discretionary-accruals proxy and the change in pre-discretionary income which means most of them are higher smoothing firms. The companies involved with *Metal Goods, Machinery and Equipment* in manufacturing industry

sector tend to smooth their earnings mostly. The firms in *Food, Beverage and Tobacco* sectorare lower smoothing firms in Turkey.

As a further study, the qualities of accounting information can be analyzedby using other methods such as timely loss recognition or value relevance; and compared with these results.

Also, the relationship between cost of debt and income smoothing can be explored by using a larger sample.

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