T.C. MARMARA ÜNİVERSİTESİ

SOSYAL BİLİMLER ENSTİTÜSÜ

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EXPLANATORY POWER OF EARNINGS ON STOCK RETURNS: EMPIRICAL EVIDENCE FROM BORSA ISTANBUL

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Danışman: PROF. DR. JALE SÖZER ORAN

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SOSYAL BİLİMLER ENSTİTÜSÜ MÜDÜRLÜĞÜ

TEZ ONAY BELGESİ

İŞLETME (İNGİLİZCE) Anabilim Dalı MUHASEBE FİNANSMAN (İNGİLİZCE) Bilim Dalı DOKTORA öğrencisi SEDA PEREK'nın EXPLANATORY POWER OF EARNINGS ON STOCK RETURNS: EMPIRICAL EVIDENCE FROM BORSA İSTANBUL

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ÖZET

KAZANÇLARIN HİSSE GETİRİLERİ ÜZERİNDEKİ AÇIKLAYICI GÜCÜ: BORSA İSTANBUL DENEYSEL BULGULARI

Muhasebe bilgileri, işletmeler tarafından işletmenin mevcut ve potansiyel hissedarları da dahil olmak üzere içsel ve dışsal karar vericilere sağlanan ihtiyaca uygun ve halka açık bilgilerdir. Muhasebe bilgilerinin arasında kazançlar sermaye piyasalarındaki kaynak dağıtımını etkileyen bir gösterge rolünü üstlenmeleri nedeniyle özel bir öneme sahiptir. İşletmeler tarafından yayınlanan muhasebe bilgileri işletmelerin uymaları gereken kanunlar çerçevesinde benimsedikleri muhasebe standartlarına bağlıdır. Bu nedenle, sağlanan muhasebe bilgilerinin kalitesi halka açık işletmelerin uyguladıkları standartlar ve prosedürlerin kalitesine dayanmaktadır. Türkiye'de Sermaye Piyasaları Kurulu halka açık işletmelerin finansal tablolarını 2008 yılında bu yana Türkiye Finansal Raporlama Standartları'na (TFRS) göre raporlamalarını gerektirmektedir. Türkiye Finansal Raporlama Standartları, Uluslararası Muhasebe Standartları Kurulu (UMSK) tarafından yayınlanan Uluslararası Finansal Raporlama Standartları'nın (UFRS) doğrudan çevirileridir. UFRS ve dolayısıyla TFRS, yöneticilerin kendi yargılarını kullanmalarına olanak tanıyan prensip bazlı standart setleridir.

Kazançlar işletmeler hakkında hayati önem taşıyan bir bilgi kaynağı olarak görülmekle birlikte bazı araştırmacılar kazanç bilgisinin sağlıklı bir bilgi kaynağı olmadığı görüşünü savunmaktadırlar. Dolayısıyla, kazançların hisse senedi fiyatlarındaki hareketleri açıklamadaki gücünün araştırılması gerekmektedir. Bu nedenle, bu tezin ana amacı kazançların hisse getirilerini açıklamadaki gücünü incelemektir. Kazanç bilgisi iki ana bileşenden oluşmaktadır: nakit akım bileşeni ve tahakkuk bileşeni. Bu farklı bileşenlerin hisse fiyatları üzerinde farklı etkileri olabilmektedir. Bunun yanı sıra, işletmelerin finansal tablolarını hazırlamada kullandıkları standartlar yöneticilerin yargılarını kullanmalarına izin verdiğinden tahakkuk bilgisi de iki ayrı bileşenden oluşmaktadır: ihtiyari olmayan tahakkuklar ve ihtiyari tahakkuklar. Bu nedenle, kazançların farklı unsurlarının görece açıklayıcı güçlerini belirlemek amacı ile kazançlar ve hisse senedi getirileri eş zamanlı ve gecikmeli olarak panel veri analizi ile incelenmiştir. İhtiyari tahakkukların ölçülmesinde Dechow (1995) tarafından geliştirilmiş olan Jones Model'in kesit varyasyonu kullanılmıştır. Borsa İstanbul'da 2008-2015 yılları dahil olmak üzere işlem görmekte olan 115 üretim firmasının kazanç ve hisse getirisi verileri analiz edilmiştir.

Deneysel testlerin sonuçları, eş zamanlı modellerde işletme faaliyetlerinden nakit akımları, ihtiyari olmayan gelirler ve ihtiyari tahakkukları açıklayıcı değişken olarak içeren modelin en yüksek açıklayıcılığa sahip olduğunu göstermektedir. Gecikmeli modellerin açıklayıcı güçleri genel olarak eş zamanlı modellerin açıklayıcı güçlerinden dikkate değer biçimde yüksektir. Bu deneysel çalışmanın sonuçları gecikmeli kazanç verilerinin hisse senedi getirileri üzerinde eş zamanlı kazanç verilerinden daha fazla açıklayıcı gücü olduğunu ima etmektedir.

GENERAL KNOWLEDGE

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ABSTRACT

EXPLANATORY POWER OF EARNINGS ON STOCK RETURNS: EMPIRICAL EVIDENCE FROM BORSA ISTANBUL

Accounting information is a publicly available information provided by companies; which is relevant to decision makers, who are the internal and external decision makers related with the company including the current and potential stockholders. Among the accounting information earnings has a crucial role in making investment decisions by investors since it has a signalling effect that directs the resource allocation in capital markets. Accounting information provided by the companies depends on the accounting standards that the companies adopt in their own legislative jurisdictions. Thus, the quality of the accounting information provided relies on the quality of the standards and the procedures that the listed companies abide by. In Turkey, the Turkish Capital Markets Board requires the listed companies to publish their financial statements according to the Turkish Financial Reporting Standards (TFRS) since 2008. Turkish Financial Reporting Standards are direct translations of the International Financial Reporting Standards (IFRS) published by the International Accounting Standards Board (IASB). IFRS, and therefore TFRS, is a principle based standard set that allows for the use of discretionary power by managers.

Whereas earnings are considered as a vital source of information about companies, there are also other researchers, who believe that earnings are not a vigorous source of information.

Therefore, the usefulness of earnings in explaining the stock price movements requires investigation. Hence, the main aim of this thesis is to investigate the usefulness, or the explanatory power of earnings on stock returns. Earnings information incorporates two main components: the cash flow component and the accruals component, which may have different effects on stock prices. Also, since the standards used by companies in preparing their financial statements requires discretionary power accruals information has two different components, as the nondiscretionary accruals and the discretionary accruals. For that reason, the different components of earnings are separately analysed in so far as to determine their relative explanatory powers through the use of panel data analysis on a contemporaneous and lagged level. The cross-sectional variation of the Jones Model by Dechow (1995) is utilized in the measurement of discretionary accruals. Earnings and stock return data of 115 manufacturing companies listed in Borsa İstanbul for the period between 2008-2015, inclusive, are analysed.

The results of the empirical tests on contemporaneous stock returns and earnings components indicate that the model that includes cash flows from operations, nondiscretionary income and discretionary accruals as the explanatory variables has the highest explanatory power among the contemporaneous models. The explanatory powers of the lagged models in general are notably higher than the explanatory powers of the contemporaneous models. The findings of this empirical research imply that contemporaneous earnings information has lower explanatory power when compared to lagged earnings information over stock returns.

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Istanbul, 2018 *Seda PEREK*

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ABBREVIATIONS

Abbreviation	Explanation
A	Total Assets
acc	Total Accruals
adjni	Adjusted Net Income
ar	Accounts Receivable, Net
BIST	Borsa Istanbul
cfo	Cash Flows from Operations
CMB	Capital Markets Board of Turkey
dacc	Discretionary Accruals
GLS	Generalized Least Squares
IFRS	International Financial Reporting Standards
NDA	Estimated Nondiscretionary Accruals
ndacc	Nondiscretionary Accruals
ndi	Nondiscretionary Income
ni	Net Income
OLS	Ordinary Least Squares
other	Other Income or Expenses, Net
PEAD	Post-Earnings Announcement Drift
PPE	Gross Property, Plant and Equipment
ppe	Property, Plant and Equipment, Net
REC	Receivables
ret	Annual Stock Return
REV	Revenues
rev	Net Sales Revenue
ROA	Return on Assets
roa	Return on Assets
SALES	Revenues
TA	Total Accruals
ta	Total Assets
TFRS	Turkish Financial Reporting Standards

1 INTRODUCTION

The purpose of this thesis is to examine the explanatory power of earnings and components of earnings on stock returns. To understand the value relevance of the components of earnings on stock returns is of particular interest to various parties including academicians, investors, accountants, and standard setting bodies, since accounting earnings are a major source of information employed in the determination of stock prices. As the publicly available information is assumed to be reflected in a timely manner on stock prices in the efficient market hypothesis, it is of interest to understand if earnings information is reflected in stock returns and if that is the case, which portion of earnings has the higher explanatory power on stock returns. It is also important to understand if managerial discretion as reflected in discretionary accruals component of earnings is value relevant. As Pfeiffer and Engels (1999) point out the reporting of these components of earnings is justified by the belief that such detailed disclosures are informative to users of financial information including investors.

In Turkey with the acceptance of the International Financial Reporting Standards (IFRS), publicly listed firms started to publish their financial statements according to IFRS since 2008. IFRS, being a principle based standard set, provides room for managers to employ their discretionary power. To examine the explanatory power of certain components of these accounting earnings produced as a result of the IFRS, they are separated into their cash flow and accrual components. Accruals are then further classified into their components that are discretionary accruals and nondiscretionary accruals. The empirical analysis in this thesis examines the explanatory power of earnings and components of earnings on stock returns in Borsa Istanbul. In addition to the analysis of the contemporaneous relation between earnings and stock returns the lagged association between the variables are also examined in the context of the post-earnings-announcement-drift.

Accounting information presented by the firms through financial statements are a product of the accounting and reporting standards that they adopt. The Capital Markets Board (CMB) in Turkey is the governing authority of the publicly listed firms and it enforces regulation about financial reporting standards. The Turkish CMB enforced the consolidation

and inflation accounting for accounting periods starting from 2003. In 2005, as part of the harmonization efforts with the European Union regulations the CMB enforced the use of the revised translation of the International Financial Reporting Standards (IFRS). The latest development in the area was in 2008 with the transition to complete translation of IFRS, which are named as Turkish Financial Reporting Standards (TFRS). (Bilgiç and İbiş, 2013 p. 126)

The main aim of IFRS is to provide useful information for decision makers, including the investors. The Conceptual Framework of IFRS states that a financial information must be relevant and faithfully representative in order to be considered as useful. These two qualitative characteristics are fundamental. In addition to being relevant and faithfully representative the usefulness of financial information is further enhanced if the information is comparable, verifiable, timely and understandable. Relevance is defined by being capable of making a difference in the decisions of users of financial information. In order to make a difference in the decisions the financial information should have predictive value, confirmatory value or both. Having predictive value means information can be used as an input in predicting future outcomes. Having confirmatory value means information provides feedback about earlier evaluations.
(http://eifrs.ifrs.org/eifrs/PdfAlone?id=17289&sidebarOption=UnaccompaniedConceptual)

IFRS being a principle based set of standards provides substantial ability to managers to apply their discretion in financial reporting. This ability provided by the standards allow the financial statements to be more informative because they enable the managers to convey their insider information about the economic substances of transactions. (Folsom et al., 2017 p. 2592)

Accounting earnings is considered the most important information item presented in the financial statements of companies. According to the economic theory, it is attributed the role of the signal to optimally direct resource allocation in capital markets. It is evidenced by including expected earnings as an explanatory variable in many of the equity valuation models. Other areas that emphasize the importance of earnings include the fact that financial analysts expressing their predictions about stock prices in the form of earnings. Moreover, managers' decisions and also their compensation is usually based on earnings. However, there are also researchers who believe the earnings are not a healthy source of information stating the differences between economic and accounting earnings and the possibilities of manipulation

and fraud that could be inherent in reported earnings. (Lev, 1989 p. 155) Thus, the research in usefulness of earnings is a vibrant research question in the area of accounting and finance.

As Lev (1989) points out the definition of usefulness of earnings information in the pioneering study of Ball and Brown (1968), which states that the observed revision in stock prices as a result of the announcement of earnings would provide evidence that this information is useful, relies on the information theory. This theory claims that an announcement is assumed to contain information if it causes a change in the related parties' probability distribution of the random variable, which in turn would cause an action, such as a change in stock prices. Then this information is considered useful and is the essence of studies that examine the association between stock returns and earnings information. Thus, to make inferences about the usefulness of such information the correlations between the dependent variable (stock returns) and the independent variable (earnings information) can be examined. This association can be observed in the explanatory power of earnings on stock returns through regressions of stock returns on earnings. If the earnings contain useful information then the explanatory power of earnings should be high as expressed by the R-squared values of these regressions. (Lev, 1989 p. 156)

The motivation of this thesis is to investigate one of the widely-researched areas in finance and accounting in the context of a developing market. Having a relatively younger history of capital markets compared to developed economies the investor sophistication also effects the use of publicly available information in making investment decisions. As part of the search for explaining the stock price movements and therefore returns, the role of accounting information is examined in more detail. The effect of earnings announcements is further investigated through decomposing the earnings into its components. To test the information content of earnings, the cash flow and accrual information in earnings is separated.

Accrual earnings is regarded a better summarized measure of performance since it mitigates the timing and mismatching problems inherent in cash flow information. In spite of the properties of accruals that increase its informativeness, it is also subject to managerial discretion due to the flexibility offered in the standards applied. Thus, the pricing of managerial discretion through discretionary accruals is a vibrant research question. (Subramanyam, 1996)

The objective of this study is to conduct a research on the explanatory power of earnings and components of earnings on the stock returns both contemporaneously and in a lagged manner (as part of the post earnings announcement drift literature) in Borsa Istanbul, the securities exchange market in Turkey. The tests provide information by indicating how the market prices the earnings by decomposing earnings into its cash flow, discretionary and nondiscretionary accruals components and investigating the association between these components and stock returns. By regressing the earnings with both contemporaneous and lagged stock returns both the pricing of earnings and the effect of the post earnings announcement drift in the stock market is investigated. For the publicly listed firms whose data are available for a specified period it presents evidence on whether earnings explain stock returns in a lagged manner. The current literature on post earnings announcement drift include various studies conducted in the United States, Europe and in emerging markets, however, this anomaly currently remains to be investigated for Borsa Istanbul. The results can then be compared to the results of studies conducted in different countries to find out the differences and similarities in findings.

The models of examining the explanatory power of earnings and components of earnings on stock returns employed in this study are not previously employed in the context of the Turkish capital markets research. Moreover, the previous studies in Turkey does not separate earnings into cash flows and accruals components. Thus, it will hopefully make an addition to the literature through the evidence provided by these models. The results of the empirical analysis are of importance to users of financial information who make their investment or portfolio restructuring decisions based on this information because they provide evidence on the informativeness of earnings.

One of the contributions of this thesis to the related literature is in the measurement of total accruals as a component of accounting earnings. As Hribar and Collins (2002) point out, accruals play a significant role in a wide array of research in accounting and finance, including the studies on the relative informativeness or value relevance of cash flows versus accruals. Having no direct access to accruals information from the cash flow statement many of the studies in this area use the balance sheet approach to calculate accruals, indirectly. This approach relies on the relation between the changes in balance sheet accounts that constitute

working capital and the accrual component of revenues and expenses on the income statement. However, non-operating events such as reclassifications, acquisitions, divestitures, accounting changes and foreign currency translations may cause non-formulated changes in current assets and current liabilities, which in turn may cause errors in estimating accruals. The error is especially substantial when these accruals are used in estimation models of discretionary accruals that may lead to false conclusions. This error effects the earnings management studies in particular. The authors suggest that researchers use cash flow information gathered directly from the cash flow statement.

Another way to measure accruals is to use the income statement approach. Total accruals are often measured as the difference between cash flows from operations and net income in the literature. However, some portion of this difference is attributable to investing activities, such as gain/loss on sale of noncurrent assets. Thus, to correctly measure the accrual component (the changes in current assets and current liabilities) the effect of these other income or losses should be eliminated from net income. The measurement of net income in this thesis adjusts for the net other income or loss that may be attributable to non-operating activities. Most of the studies in the literature do not make such an adjustment to net income while measuring total accruals. Thus, this thesis makes a contribution to the measurement of accruals in this manner.

The remainder of this thesis is organized as follows: Section 2 reviews related literature, Section 3 explains the data and methodology employed in the empirical study, Section 4 explains the results of empirical analyses and Section 5 concludes. Section 2 includes three subsections; the first one examines literature regarding the studies in the area of value relevance and usefulness of earnings in terms of informativeness. The second subsection of Section 2 reviews the related literature on measuring discretionary accruals. The section includes the prominent studies that develop the contemporary models used in measuring the discretionary portion of accruals as well as the studies that evaluate the strength and the applicability of the models in various settings. The third subsection of Section 2 includes information about the post earnings announcement drift phenomenon. Section 3 explains the data used and the methodology employed for the measurement of discretionary accruals and for the regressions used to estimate the explanatory power of earnings and its components,

including the equations used in hypothesis testing. Section 4 reviews the results of the empirical analysis conducted in this thesis, presenting the summary statistics and the results of the regression models. Section 5 contains the concluding remarks and suggestions for areas of further research.

2 REVIEW OF LITERATURE ABOUT EXPLANATORY POWER OF EARNINGS

The main objective of the thesis is to examine the explanatory power of earnings and its components on stock returns. The related literature includes areas of studies in value relevance of earnings information to stock returns, the discretionary accrual models and the post earnings announcement drift. Thus, the first section of the review of theories and empirical studies is devoted to research in this area. The components of earnings include cash flow and accrual measures. Accruals are further separated into their discretionary and nondiscretionary components using validated techniques. The second section of the review will be focused on research in this area. The third part of the review is concentrated on post earnings announcement drift phenomena, which will be utilized as part of the tests that regress stock returns over lagged earnings components in this thesis.

2.1 VALUE RELEVANCE OF EARNINGS

The utilization of the information contained in financial statements in stock market transactions has been heavily investigated in accounting and finance literature. The usefulness of accounting information has started to be tested against the behaviour of stock prices, which was enabled by the developments in the capital theory. This was due to the building theory asserting that if an information is useful in determining the capital asset prices, then this information will be reflected in the asset's price since the markets are efficient. (Ball and Brown, 1968 p. 160) After the development of the efficient market hypothesis there has been an ongoing accumulation of evidence against the theory that has driven the interest of researchers towards fundamental analysis, valuation and tests of market efficiency. (Kothari, 2001 p. 107)

There has been extensive research testing the three levels of market efficiency in the last five decades. The second form of market efficiency, the semi-strong form, assumes that prices fully reflect all publicly available information (Fama, 1970, p. 383). Examples of publicly available information include annual reports published and, dividends, stock splits and new issues announcements by companies. The tests of semi-strong form of efficiency had contradicting results in various studies, meaning that stock prices may not fully or timely reflect

all of the publicly available information. One of the major challenges to the semi-strong form of efficiency is the fact that stock prices do not respond fully and immediately to publicly announced earnings (Bernard and Thomas, 1990).

Beaver (1968) states in his seminal study that earnings are said to have information content if they lead to a change in the equilibrium value of the current market price by causing the investors to change their assessments of the probability distributions of future returns. The author also states that another definition of information posits that the change in expectations must be high enough to cause a change in investors behaviours. Meaning that the earnings information must cause the investors buy more of the shares of a company or sell some or all of the shares held by them. Thus, this change in behaviour should be observed in the volume of shares traded around the announcement of earnings. (Beaver, 1968 p.68-69) The evidence from the study suggest that there is an important increase in volume of trade in the announcement week, which implies that the investors actually change their portfolio positions during earnings announcements that leads to the fact that earnings have information content. (Beaver, 1968 p. 74)

Collins et al. state in their 1994 study that earnings have a low explanatory power in explaining stock returns despite the obvious statistical association between contemporaneous returns and earnings measures. The authors state that there are two major explanations to this evidence. The first is lack of timeliness in earnings in capturing the value-relevant events and the second one value-irrelevant noise. The authors relate first reason to the nature of accounting, which is based on accruals. The application of the accrual basis leads to recognizing the effects of new investments, advertising expenses, research and development expenditures and changing market conditions in a lagged manner when the effects of these events are immediately reflected in stock returns, through changes in expectations about future earnings and thus stock prices. This leads out to the positive association between current earnings and past returns. In addition to this value-relevant yet lagged element of earnings the noise element is not associated with none of the returns in the timeline. Thus, the authors examine the returns earnings relationship to find the reason of the low association between earnings and stock returns. The evidence from the empirical study suggests that while lack of timeliness in earnings

is a major contributor of the low contemporaneous returns-earnings association; there is no such evidence towards the noise in earnings explanation to it. (Collins et al. 1994 p. 290-291)

One of the main areas of research in this area focuses on the explanatory ability and information content of earnings on stock returns. Most of these studies further separate earnings information into its accrual and cash flow components. Since traditional accounting systems provide earnings information on an accrual basis, researchers rightfully attempt to understand the specific information content of both accruals and cash flows as reflected in stock returns. Some of the studies indicate the superiority of accruals in measuring firm performance while others opt for cash flow information. The proponents of cash flow information base their expectations on two grounds: The first one is that since cash flows are realized in the current period and accruals are associated with future cash flows the market values accruals with a discount for risk and futurity; the second ground is that cash flows are evidenced to be more persistent than earnings. (Pfeiffer and Elgers, 1999, p. 240) While accruals provide an internally generated performance measure that overcome the problem of information asymmetries between management and other parties outside the company, the net cash receipts generated by a company is the ultimate measure of success. However, the net cash flow information incorporates timing and mismatching problems. Therefore, one of the reasons stated in considering accruals as a superior performance measure is the fact that accruals diminish the mismatching and timing issues of cash flows over short intervals. (Dechow, 1994, p. 4)

Dechow et al. examine the relation between earnings and cash flows in their 1998 study using a sample of 1337 firms to conclude that current earnings are a better forecast of future cash flows than current cash flows. In line with their 1994 study the authors conclude that "working capital accruals incorporate the negative correlation in operating cash flows in earnings and make earnings more timely than operating cash flows (in the sense of being more correlated with contemporaneous stock returns)." (Dechow et al. 1998, p. 166)

Accruals are dependent to some extent on the discretion of managers. Examples of managerial discretion employed in accounting include the write down of assets, the recognition or deferral of revenues, and capitalizing or expensing certain costs. Moreover, making accounting estimates, making changes in those estimates and changing accounting methods also require the discretion of managers. (Dechow et al. 1995 p. 408) Due to this nature of

accruals they are both eligible to be used as a signalling tool since they reflect the superior information of management and to be used as a manipulation tool to smooth accounting earnings. Although, the accounting standards and principles restrict managers from distorting the financial data and auditing increase the credibility of financial information, these systems are considered imperfect as well. (Healy and Palepu, 1993, p.9)

According to Riahi-Belkaoui the positive theory of accounting tries to "explain and predict management's choice of standards by analysing the costs and benefits of particular financial disclosures in relation to various individuals and to the allocation of resources within the economy." The two aims of the approach are to improve the reliability of forecasts that are made based on the actual accounting earnings that are subject to smoothing and to lessen the uncertainty that stems from the volatility in accounting earnings and the systematic risk by reducing the covariance of a firm's returns with market returns. (Riahi-Belkaoui, 2004 p. 446)

The two major hypotheses related with the positive accounting theory are the income smoothing and the earnings management hypotheses. Income smoothing is a variety of earnings management as pointed out by Cahan et al. in their 2008 study. (Cahan, Liu, Sun, 2008 p.3) Income smoothing can be defined as the effort to normalize the income to a desired level by using the tools that are allowed in the accounting standards such as choosing accelerated or straight-line depreciation, choosing cost or equity method, pension costs, dividend income, gains and losses on sale of marketable securities, investment tax credits etc. (Riahi-Belkaoui, 2004 p. 453) Copeland (1968) lists the characteristics of a smoothing tool as follows:

- It should not commit the firm to any future action,
- It should be based on expertise and in line with the generally accepted accounting principles,
- It should lead to material shifts,
- It should only be a reclassification of internal account balances,
- It should be used over consecutive periods of time.

Healy and Wahlen report in their 1999 study that standards should enable management to exercise their judgement in financial reporting for financial information to communicate the managements' information on their firm's performance. This way management can express

their insider knowledge of their company through selecting reporting methods, estimates and disclosures. (Healy and Wahlen, 1999 p. 366) The proper communication of valuable information to stakeholders would then improve the resource allocation decisions. (Healy and Wahlen, 1999 p. 369) Examples of accruals or methods that require managements' discretion include the estimates of net receivables, useful life and disposable value estimates related with depreciation, loan loss reserves of banks and claim loss reserves of insurance companies, and deferred tax valuation allowances. (Healy and Wahlen, 1999 p. 372) Also the selection of FIFO vs. weighted average inventory methods, the accrual of estimated potential expenses such as bad debt expense, warranty expense and others require the discretion of managers. (Lee and Vetter, 2015 p. 63)

In literature, discretionary accruals are considered as a proxy for earnings management due their aforementioned nature. The concept is explained in their 1989 study by Schipper (p.92) as "a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain". One of the uses of discretionary accrual models is to test the hypotheses about management's incentives to manipulate earnings. However, the research on models of identifying discretionary accruals also enable researchers to examine the correlation between the discretionary and nondiscretionary components of earnings with stock returns. (Kothari, 2001 p. 161-162) Dye and Verrecchia (1995) provide evidence on the superiority of expanding discretion in accounting standards.

The 1987 study by Bowen et al. present evidence on the incremental information content of cash flows and accruals using two alternative perspectives. The first of the perspectives examines the incremental information content of cash flows after controlling for accruals. The second perspective examines whether accruals have additional information content over cash flow information. The results of this perspective provide significant evidence on the additional information content of earnings after controlling for cash flows. The authors conclude that accrual accounting data have incremental explanatory power beyond what is contained in cash flows alone. (Bowen et al. 1987, p. 746)

Subramanyam reports in his 1996 study that the discretionary accruals are actually priced by the stock market. The reason of this result is stated as the discretion of managers, which enable the earnings of companies to reflect fundamental value in a better way.

(Subramanyam, 1996 p. 278) The author states that literature suggests that managers use their discretion provided to them by the accounting rules to communicate their private knowledge of the company to the market and he states that this might be useful in understanding the information content of discretionary accruals in the stock market. (Subramanyam, 1996 p. 272) The study includes the regression of stock returns on the levels of earnings and its components. In the first group the author regresses stock returns against three single earning components: cash flows from operations, nondiscretionary income and net income. In the second group of tests stock returns are regressed against multiple earnings components in order to measure the incremental information content of discretionary and nondiscretionary components of earnings. (Subramanyam, 1996 p. 258-259) The author measures nondiscretionary accruals using the cross-sectional variation of the Jones Model as defined in DeFond and Jimbalvo (1994). The model measures nondiscretionary accruals using a regression. One of the explanatory variables in the model is the property, plant and equipment and the second explanatory variable is changes in revenue. The author suggests the use of cross-sectional version because while the discretionary and nondiscretionary components of earnings in the time series version of the Jones model are out-of-sample predicted values whereas in the cross-sectional version the two are the fitted values and the residuals, respectively. (Subramanyam, 1996 p. 253-254)

Sankar and Subramanyam examine the information content of earnings in their 2001 study. The results of their research indicate that the managers use their judgements in financial reporting to communicate private information about their companies and this increases the information content of earnings announcements in equilibrium. The authors also point out that the investors attach a greater weight to earnings under a regime that allows discretion even if its restricted than a regime that allows no discretion at all. (Sankar and Subramanyam, 2001 p. 366)

Francis et al. examine the pricing of accruals quality, which they use as a proxy for information risk related with earnings, in capital markets. The accruals quality is measured separately for the portion that is caused by economic fundamentals and management discretion. The authors conclude that firms with higher accruals quality face lower cost of capital when compared to firms with lower accruals quality. Moreover, the authors evidence that the fundamental accruals quality has a larger effect on cost of capital than the discretionary accruals

quality since discretionary accruals may reflect both income smoothing and better performance measurement. (Francis et al. 2005, p. 295-296)

Sloan states in his 1996 paper, where he examines if stock prices reflect information about future earnings contained in cash flow and accrual components of current earnings, that stock prices act as if investors are not accurately identifying the different properties of these two components of earnings. This leads to the conclusion that the stock prices do not fully reflect all publicly available information. However, the author states that this fact does not necessarily imply that investors are irrational since information acquisition and processing costs in order to implement the strategy developed in that research cannot be ignored and the price pressure effects also play an important role in real life. (Sloan, 1996 p. 314)

The studies in this are that are conducted in Turkey include the study by Bilgiç and İbiş (2013). The authors examine the value relevance of earnings and other financial statement information during the period of 1997-2011 by Ohlson model (1995). The study is of significant contribution since it uses data from a long period of time, which includes financial statement information prepared under different sets of accounting standards. This enables the readers to observe the improvement in the value relevance of earnings through changes in legislation. The authors conclude that book values and earnings are significantly value relevant both in combination and individually in explaining stock prices. One of the findings of the authors is of significant importance for the results of this thesis. The study reveals that the value relevance of book value increases with the adoption of new reporting standards, however there is a decrease in the value relevance of earnings with the adoption of new reporting standards. This is consistent with the findings of this thesis, since discretionary accruals are shown to have no explanatory power over nondiscretionary income in the period where IFRS was employed by the publicly listed companies. Which implies that the IFRS, granting more discretion to managers in generating accruals, is interpreted by the investors as a distortion to earnings information.

Another study that uses data from the Turkish capital markets is the research by Türel (2009). In his study Türel compares the value relevance of earnings and book value for two periods in which two different sets of accounting standards were used using the Ohlson model (1995). The sample includes all of the listed companies in Borsa Istanbul except for the

financial firms. The author compares the 2001-2002 period, when the accounting standards issued by the CMB were in force, to the 2005-2006 period, when IFRS were in force. The author has a different conclusion compared to the study by Bilgiç and İbiş (2013). He concludes that the value relevance of earnings and book value of equity increase significantly after the adoption of IFRS.

Suadiye (2012) has conducted a similar study on value relevance of earnings in Turkey using earnings and book value data prepared in accordance with the local standards in the 2000-2002 period and earnings and book value data prepared in accordance with IFRS in the 2005-2009 period. The aim of this study is also to compare the effect of mandatory adoption of IFRS on the value relevance of earnings as measured by the Ohlson model (1995). The author uses data from all of the companies listed in Borsa Istanbul (including financial firms), except for the ones that have missing data. The results of this study show that earnings and book value are significantly related to stock prices under the two different reporting regimes. The author also concludes that book value of equity is more value relevant than earnings and the adoption of IFRS increased the value relevance of accounting information for Turkish listed firms.

Uyar (2017) reports similar findings on his study conducted using data for the 2000-2004 and 2005-2009 periods gathered from 225 companies listed in Borsa Istanbul stock exchange. The sample includes all of the companies that have data available for the two periods. The author uses the Ohlson model (1995), Standardized Ohlson model by Harris and Muller (1999) as well as the exponential Ohlson model by Schiebel (2006). The author drops the Ohlson model due to multicollinearity. The author concludes that the results of the standardized Ohlson model indicates an increase in R-squared of all models after the adoption of the IFRS. Thus, the use of IFRS after the 2005 period improved the performance of financial statements in explaining the market values of stocks compared to the use of local accounting standards.

Güvercin and Demir (2015) study the effect of earnings announcements on firm value by examining 78 firms listed in BIST 100 Index of Borsa Istanbul for the five-year period between 2009-2013. The authors use quarterly data and use two modelling approaches. The first one is event-study to analyse the effects of earnings announcements on market value of stocks in the short run. They use daily return information in this method. The second approach uses panel data analysis to analyse the effects of earnings announcements on market value of

stocks in the long run. In this case, monthly returns after the announcement date is used. The authors conclude that panel data analysis provide evidence that earning announcements influence firm value. The authors also state that the results indicate an increase in firm value when there is a positive surprise in earnings announcements and a decline in firm value when there is a negative surprise in earnings announcements. In addition, they suggest that earnings persistence have a magnifying effect on the effect of earnings surprises on firm value.

Some of the studies in literature posit the decline in the contemporaneous linear relation between annual stock returns and earnings. Francis and Schipper (1999), Lev and Zarowin (1999), and Ryan and Zarowin (2003) investigate the explanation for this decline in the contemporaneous relation between annual stock returns and accounting earnings information.

Francis and Schipper (1999) and Lev and Zarowin (1999) examine the decline in the usefulness of financial information to stock markets. Francis and Schipper (1999) focus on the concern that financial statement information has lost a significant portion of its relevance to investors. Applying two different measures over a broad range of sample of companies listed in the stock exchange and NASDAQ for the period 1952-1994 the authors evidence a decrease in the explanatory power of earnings levels and changes in returns, significantly. The value relevance in the study is first measured as the total return that could be earned if financial statement information had been previously known. The second measure of value relevance is based on the explanatory power of accounting information for measures of market value, which is operationalized by measuring the ability of earnings to explain annual market-adjusted returns and the ability of earnings and book values of assets and liabilities to explain market values of equity. Loss of relevance is measured as a decrease over time either in the returns that could be earned from the foreknowledge of financial statement information or in the explanatory power of accounting information.

Lev and Zarowin (1999) examine the usefulness of financial information to investors. The authors evidence the decline in the usefulness of financial information such as earnings, cash flows and book values over the past two decades. The authors attribute this decline in spite of the increase in investors demand for relevant information and the efforts of regulators to improve the quality and timeliness of financial information to “change”. The authors state that

the effect of change on companies' operations and economic conditions is not reflected sufficiently by the prevalent reporting system. One of the reasons of the change is stated as the increased investments made by companies in restructuring and research and development that are expensed as period costs, whose benefits are recorded later creating a mismatching problem. Moreover, the innovative investments made by the companies in the form of investments in intangible assets such as information technology, brands and human resources are considered as the major drivers of change. Thus, the major pitfall of the current reporting system is in the accounting for intangible assets failing to reflect the enterprise value and performance because of the aforementioned inability to match revenues generated by these activities with the expenses due to these items. The authors recommend two solutions to the decline in the usefulness of financial information. The first proposal is to create system that requires a comprehensive capitalization of intangible investments and the second one is to restate the financial reports in a systematic manner. (Lev and Zarowin, 1999 p. 354)

Ryan and Zarowin (2003), examine two alternative but interacting explanations to this observation. The first explanation is that accounting earnings reflect news with a lag to stock prices and the second explanation is that earnings increasingly reflect good and bad news in an asymmetric manner. According to the authors to understand the reasons behind this situation is important for policy makers and users of financial information for they would decide if any action should be undertaken to address this situation. (Ryan and Zarowin, 2003, p. 523-524)

2.2 POST-EARNINGS-ANNOUNCEMENT DRIFT

Ball and Brown were the first to examine the delayed response of stock market to accounting information (post earnings announcement drift) in their 1968 study, while the objective of the authors was to evaluate the usefulness of accounting information. Ball & Brown were the first to examine this phenomenon in their study, where they provided evidence about the adjustment of stock prices to earnings announcements and the information content of these announcements. Their findings suggested that most of the information in the earnings reports are anticipated by the market before the announcement is made and the actual earnings announcement does not cause any unusual jumps in the announcement month. This anomaly

has come to be known as the post earnings announcement drift (PEAD), which investigated the drift in the stock prices following an earnings announcement (Mahmoudi et al. 2011). Ball and Bartov (1996), define the post-earnings announcement drift as the "ability of current earnings information to predict future abnormal returns" and point out that the phenomenon has attracted considerable attention after the paper by Ball and Brown (1968). (Ball and Bartov, 1996 p. 321)

Bernard and Thomas report in their 1989 study that the upward drift is observed in the cumulative abnormal returns of firms with good news and the downward drift is observed in the cumulative abnormal returns of firms with bad news. (Bernard and Thomas, 1989).

Several other studies that examine the post earnings announcement drift include Joy, Litzenberger, and McEnally (1977), Watts (1978), Rendleman, Jones, and Latane (1982), Foster, Olsen, and Shevlin (1984), Bernard and Thomas (1989 & 1990) and Chan et al. (1996). Fama reports in his 1998 study that the post earnings announcement drift is one of the anomalies above suspicion, although the anomaly is stronger for smaller stocks.

The explanation for the post earnings announcement drift is classified under two categories. The first one suggests that the price response to new information about earnings is delayed. This might be caused by the failure of investors to incorporate available information or transaction costs and costs of implementing a trading strategy might prevent investors to gain from this anomaly. The second explanation is that since the abnormal returns are calculated using the capital asset pricing model and it might be incomplete or misestimated then the return might not be fully adjusted for risk (Bernard and Thomas, 1989). However, in their 1990 paper the authors conclude that the failure to adjust abnormal returns fully for risk is not able to be an explanation for the anomaly (Bernard and Thomas, 1990).

Shivakumar (2006) states in his study that while researches by Ball, Kothari and Watts (1993), Foster, Olsen and Shevlin (1984), Kim and Kim (2003), Garfinkel and Sokobin (2006) attribute the post-earnings announcement drift to mis-specified asset pricing models, other studies by Bernard and Thomas (1989 and 1990), Ball and Bartov (1996) and Mendenhall (2004) provide evidence for the argument that the drift arises from the under-reaction of investors to bad news. (Shivakumar, 2006 p.2) The research by Shivakumar (2006) also contributes to the evidence to support the irrationality explanations for the post-earnings

announcement drift. The author concludes that unexpected cash flows are more positively related to future returns, than are unexpected accruals. Moreover, unexpected cash flows are found to predict future returns above and beyond that predicted by earnings surprises. Another indication of the study is that a strategy that decomposes earnings news into its components significantly outperforms strategies based on earnings news alone. (Shivakumar, 2006 p.1)

Ball et al. (1993) provide evidence for a statistically significant and positive association between changes in earnings and equities' relative risks. However, only a small proportion of changes in earnings can be attributed to changes in risks. (Ball, Kothari and Watts, 1993, p. 637)

Kim and Kim (2003), employ a four-factor model by adding a fourth factor (risk factor that is related to earnings surprise) to the Fama-French's (1993 and 1995) three factor model and suggest that this additional risk factor provides a significant improvement in explaining the post-earnings announcement drift. The authors conclude that the drift observed in prior studies may be a result of mis-specified models and failing to adjust raw returns for risk. (Kim and Kim, 2003 p. 383)

Garfinkel and Sokobin (2006) use quantity of volume at the earnings announcement date that cannot be explained by prior trading behavior as the proxy for investor opinion divergence and conclude that this unexpected trading volume correlates with future returns. (Garfinkel and Sokobin, 2006 p. 86)

Ball and Bartov, on the other hand, evidence in their 1996 study that investors do not act as if using a naïve expectations model; the naïve expectations model being a simple seasonal random walk model. Moreover, the authors note that investors do exploit serial correlations at lags one to four in seasonally differenced quarterly earnings and while doing that they use the correct signs but they underestimate the magnitude of serial correlation by 50% on average. (Ball and Bartov, (1996) p. 320)

Mendenhall questions in his 2004 study that if the post-earnings announcement drift is the result of the under-reaction of investors to value-relevant earnings information, then why the unbiased investors do not or cannot eliminate the anomaly and enforce market efficiency. The author provides evidence in favor of the under-reaction to earnings surprises explanation

and explain the reason unbiased investors cannot eliminate the anomaly since the required trades are risky. (Mendenhall, 2004 p. 875-876)

Measuring the informativeness of earnings sheds light to market quality. The ability of the stock prices to reflect available information is evidenced to affect capital allocation decisions as well as real investment decisions. The accounting results are a key source of firm-specific information; therefore, they are expected to play a central role in the informational efficiency of a capital market. (Perotti and Windisch, 2017, p. 375-376)

As the empirical study in this thesis includes the estimation of discretionary accruals to measure the explanatory power of this component of earnings separately, the next section reviews the discretionary accrual models in the literature.

3 REVIEW OF LITERATURE ABOUT DISCRETIONARY ACCRUAL MODELS

This section review the five well-known time-series models of discretionary accruals: The Healy (1985) model, the DeAngelo (1986) model, the Jones (1991) model, the Dechow and Sloan (1991) model, and the modified Jones Model by Dechow et al. (1995).

3.1 THE HEALY (1985) MODEL

The Healy model as pointed out by Dechow et al. in their 1995 study, tests for earnings management by comparing mean total accruals across the earnings management partitioning variable. The partitioning variable in Healy's model divides into three groups. One of the groups include samples where earnings are predicted to be managed upwards and the other two include samples where earnings are predicted to be managed downwards. Then the mean total accruals of the group where earnings are predicted to be managed upwards is compared to the mean total accruals in the other two groups. The Healy model for nondiscretionary accruals is as follows:

$$NDA_{\tau} = \frac{\sum_t TA_t}{T} \qquad \textit{(Eq. 3.1)}$$

where:

NDA=estimated nondiscretionary accruals,

TA=total accruals scaled by total assets,

t=1,2…t is a year subscript for years included in the estimation period,

τ=year subscript indicating the year in the event period.

3.2 THE DeANGELO (1986) MODEL

DeAngelo (1986) treats the total accruals in the prior period as a benchmark to what the current accruals would be without any earnings management and the author measures the manipulated portion by the change in total accruals. Assuming this, the author tests if the average value of the abnormal accrual is significantly negative in periods before a management

buyout, which would then represent systematic understatement of earnings. The author calculates total accruals as the difference between net income and cash flows from operations. The operating cash flows is calculated using the balance sheet approach by adjusting the working capital from operations for the changes in all current operating related accounts. (DeAngelo 1986 p. 409) The DeAngelo model for nondiscretionary accruals is as follows:

$$NDA_{\tau} = TA_{\tau-1} \qquad \textit{(Eq. 3.2)}$$

where:

NDA=estimated nondiscretionary accruals,

TA=total accruals scaled by total assets.

DeAngelo model assumes that the average change in nondiscretionary accruals is approximately zero, thus any change in total accruals is an indication of a change in discretionary accruals. (Jones, 1991 p. 207)

Both Healy and DeAngelo models depend on the assumption that nondiscretionary accruals are constant in time and discretionary accruals have a zero mean in the estimation period, otherwise the models would not measure the nondiscretionary accruals without error. The choice of the appropriate model then depends on the time series nature of nondiscretionary accruals. The Healy model is appropriate for circumstances where nondiscretionary accruals follow a white noise process around a constant mean; while the DeAngelo model is appropriate for circumstances where nondiscretionary accruals follow a random walk. (Dechow, 1995 p. 198)

3.3 THE JONES (1991) MODEL

Jones examines whether the firms engage in earnings management during import relief investigations in the United States in her 1991 study. The author examines the companies that have an incentive to reduce their earnings to benefit from import relief. The author states that companies may have such an incentive since the United States International Trade Commission makes the relief decision based on a number of facts including the earnings of a company. (Jones, 1991 p. 193) The author measures total accruals as the change in noncash working

capital before income taxes payable less total depreciation expense. Change in noncash working capital before taxes is measured as the change in current assets (excluding cash) and short-term investments less current liabilities (excluding the current maturities of long-term liabilities and income taxes payable). (Jones 1991, p.207) To relax the assumption on the DeAngelo model that calls for the average change in nondiscretionary accruals to be approximately zero, Jones uses the following model for total accruals (Jones, 1991 p.210-211)

$$\frac{TA_{it}}{A_{it-1}} = \alpha_i \left[\frac{1}{A_{it-1}}\right] + \beta_{1i} \left[\frac{\Delta REV_{it}}{A_{it-1}}\right] + \beta_{2i} \left[\frac{PPE_{it}}{A_{it-1}}\right] + \epsilon_{it} \qquad \textit{(Eq. 3.3)}$$

where:

TA_{it} = total accruals in year t for firm *i*;

ΔREV_{it} = revenues in year *t* less revenues in year *t* – 1 for firm *i*;

PPE_{it} = gross property, plant and equipment in year *t* for firm *i;*

A_{it-1} = total assets in year *t-1* for firm *i*;

i = 1,…,N firm index

t = 1,…,T_i, year index for the years included in the estimation period for firm *i.*

Jones states in her study that the change in revenues are included in the model to control for changes in nondiscretionary accruals that occur as a result of condition changes. Changes in total accruals include changes in items such as accounts receivable, inventory and accounts payable that rely on the changes in revenues to some extent. The item gross property, plant and equipment is also included since some of the total accruals are related to nondiscretionary depreciation expenses. Since the depreciation expenses are included in total gross property, plant and equipment is also measured at its level rather than the change in this item. All of the items are scaled by lagged total assets to reduce the heteroscedasticity of the model. The model assumes that the relation between nondiscretionary accruals and the explanatory variables is stationary. (Jones, 1991 p. 211-212)

The limitation in Jones model, which is also recognized by the author, is that the model assumes that the revenues are nondiscretionary. If the management decides to accrue a revenue that is not necessarily earned then the model will take this discretionary component out and cause the earnings management to be undetected. (Dechow et al., 1995 p.199)

3.4 THE DECHOW AND SLOAN (1991) MODEL (THE INDUSTRY MODEL)

The industry model is similar to the Jones model in that the model also relaxes the assumption that nondiscretionary accruals are constant. The difference between the two models is that the industry model assumes that the changes in the determinants of nondiscretionary accruals are common for the firms in the same industry. The authors used the following model to measure nondiscretionary accruals:

$$NDA_t = \gamma_1 + \gamma_2 Median_1(TA_t) \qquad \textit{(Eq. 3.4)}$$

where:

NDA_t = nondiscretionary accruals in year t

γ_1 and γ_2 = firm specific parameters (estimated using OLS on the observations in the estimation period)

$Median_1$ (TA_t) = the median value of total accruals scaled by lagged assets for all non-sample firms in the same industry code.

The industry model is designed to diminish the measurement error in discretionary accruals since the model only removes the variation in nondiscretionary accruals if they are common within the industry. Thus, changes in nondiscretionary accruals that are peculiar to a firm remains in the discretionary accrual proxy of the model. However, since the model removes variation in discretionary accruals that are common within an industry, this mitigates the ability to detect earnings management if it is common across an industry. (Dechow et al., 1995, p.199-200)

3.5 THE MODIFIED JONES MODEL BY DECHOW ET AL. (1995)

Dechow, Sloan and Sweeney develop a modified version of the Jones model in their 1995 study. The modified model aims to diminish the error in measurement of the discretionary portion of the accruals when revenues are managed by discretion. The modified Jones model measures the nondiscretionary accruals in the event period using the following model:

$$NDA_{\tau} = \alpha_1 \left(\frac{1}{A_{\tau-1}}\right) + \alpha_2(\Delta REV_{\tau} - \Delta REC_{\tau}) + \alpha_3(PPE_{\tau}) \qquad \textit{(Eq. 3.5)}$$

where:

NDA_t = nondiscretionary accruals in year t

A_{t-1} = total assets in year t-1;

ΔREV_t = revenues in year t less revenues in year t – 1;

ΔREC_t = receivables in year t less receivables in year t – 1 scaled by total assets at year t-1;

PPE_t = gross property, plant and equipment in year t.

The coefficient estimates in the model and the estimates of nondiscretionary accruals during the estimation period are obtained from the Jones model. The modification provided by this model is adjusting the revenues for the changes in receivables in the event period. The modified model changes the implicit assumption of the original Jones model that revenues are subject to managerial discretion none of the estimation and event periods; to an implicit assumption that all changes in credit sales during the event period depends on managerial discretion. This assumption then will eliminate the problem of managerial discretion estimation to be biased toward zero in times when earnings management occurs as a result of the management of revenues. (Dechow et al. 1995, p. 199) The authors conclude that the Modified Jones model is more powerful in testing earnings management than any of the other models (Healy model, DeAngelo model, Jones model, Modified Jones model and Industry model) examined. (Dechow et al. 1995, p. 223)

3.6 THE PERFORMANCE-MATCHED DISCRETIONARY ACCRUALS MODEL BY KOTHARI ET AL. (2005)

Kothari et al. state in their 2005 paper that the existing models fail to estimate discretionary accruals accurately. Especially, discretionary accrual models that are commonly used in literature (the Jones (1991) and the Modified Jones (1995) Models) are misspecified when they are applied to samples which experience extreme performance. (Kothari 2005 p.166) The authors test a performance-matched discretionary accrual approach to find out whether this approach is well specified and powerful at estimating discretionary accruals, where matching is on the basis of return on assets (ROA) and industry classification. (Kothari 2005 p. 164-165) The reasons for choosing ROA as the performance measure is stated as follows: "First, the Dechow et al. (1998) model of accruals discussed in Section 2 suggests ROA controls for the effect of performance on measured discretionary accruals. Second, matching on ROA follows Barber and Lyon's (1996) approach to detecting abnormal operating performance (Barber and Lyon do not focus on accruals) using a matched-firm research design. They find that matching on an operating performance measure similar to the ROA tends to be better than matching on other variables." (Kothari 2005 p. 165) The authors also state that while performance matching does not solve all the problems arising from bad discretionary accrual models or from a researcher's failure to recognize the accrual management incentives that are unique to the research question being addressed, the approach they employ provides additional controls for what is considered 'normal' earnings management.

The authors estimate a similar model to the Jones and Modified Jones models. The model includes ROA_{it} or ROA_{it-1} as an addition to the earlier Jones models. The Performance Matched Model of Kothari et al. is as follows:

$$TA_{it} = \delta_0 + \delta_1 \left(\frac{1}{ASSETS_{it-1}}\right) + \delta_2 \Delta SALES_{it} + \delta_3 PPE_{it} + \delta_4 ROA_{it(or\ it-1)} + \nu_{it}$$

(Eq. 3.6)

where:

TA_{it} = Total accruals in year t for firm i;

$\Delta SALES_{it}$ = Sales revenues in year t less revenues in year t – 1 for firm i;

PPE_{it} = Gross property, plant and equipment in year t for firm i;

$ROA_{it(or\ it-1)}$ = Return on assets in year t or t-1 for firm i.

Making an unbiased estimation for the nondiscretionary portion of accruals is a daunting task. Model misspecifications in these estimation models can lead to type I and type II errors. Type I errors occur when biased estimations of discretionary accruals lead to the false conclusion that earnings management occurs (rejection of the null hypothesis); type II errors occur when biased estimations of discretionary accruals lead to the failure to detect earnings management. (Lee and Vetter, 2015 p. 64)

Guay et al. (1996) examine the relative variability of earnings elements, the correlation between the discretionary accruals and nondiscretionary earnings, and the relationship between stock returns and earnings components. (Guay, Kothari, Watts 1996 p. 83-84) The evidence from the authors' research suggest that the Healy, DeAngelo and industry models are not effective in detecting discretionary accruals under any of their hypotheses. Whereas, the Jones and the modified Jones models are found to be consistent with both of the hypotheses; one of which assuming discretionary accruals increase the performance of earnings and the other one assuming discretionary accruals are a tool for opportunistic income smoothing. (Guay, Kothari, Watts 1996 p. 86)

Kothari et al. state in their 2005 paper that although the Jones and the Modified Jones models use assets as the deflator, with an intention to decrease the heteroscedasticity in residuals, it does not eliminate it in total but reduces it. (Kothari 2005, p.173 and 186) The authors state that Jones and Modified Jones models are misspecified in stratified random samples and under a variety of sampling conditions, the use of a performance matched measure based ROA_t and the Jones model is evidenced to be useful despite the existence of instances where even this measure is misspecified. (Kothari 2005, p. 186-187)

The evidence from studies including Dechow (1995) suggesting that the Jones models may be misspecified for samples that are skewed toward firms with high performance brings about the question that whether it is better to use performance matched models in measuring discretionary accruals. Keung and Shih (2014) state that the use of performance matched models for samples that are not skewed or for samples whose skewedness is caused by earnings

management in response to the hypothesized stimulus would create some errors. The authors conclude in their empirical study there are two problems associated with using a performance matched model. The first problem is that there is a systematic decline in the power of test when performance matching is used. Thus, this measurement error together with the fact that performance matching increases noise in estimated discretionary accruals makes it difficult to detect earnings management using performance matching models. The second problem stated by the authors is that the loss of power caused by performance matching is higher than expected. Not only the studies that test whether an event induces earnings management; but also, the studies that include discretionary accruals estimated with performance matching as the independent or the dependent variable in their regression analyses are affected from this problem since the regression coefficient will be biased toward zero. (Keung and Shih, 2014 p.763)

4 EMPIRICAL RESEARCH ON THE EXPLANATORY POWER OF EARNINGS ON STOCK RETURNS

Empirical research in this thesis includes several regression models including stock returns as the dependent variable and earnings and components of earnings as the independent variable using panel data analysis.

4.1 HYPOTHESIS DEVELOPMENT

According to the review of related prior literature two groups of seven hypotheses are developed to measure the explanatory power of earnings and components of earnings on stock returns. The first group of hypotheses are related to the contemporaneous relation between stock returns and earnings, whereas the second group is related to the lagged association between stock returns and earnings.

The first group of hypotheses are presented in their null and alternative forms as follows:

$H_{1,0}$: Contemporaneous stock returns are not related to cash flows from operations.

$H_{1,1}$: Contemporaneous stock returns are related to cash flows from operations.

$H_{2,0}$: Contemporaneous stock returns are not related to nondiscretionary income.

$H_{2,1}$: Contemporaneous stock returns are related to nondiscretionary income.

$H_{3,0}$: Contemporaneous stock returns are not related to net income.

$H_{3,1}$: Contemporaneous stock returns are related to net income.

$H_{4,0}$: Contemporaneous stock returns are not related to cash flows from operations and total accruals.

$H_{4,1}$: Contemporaneous stock returns are related to cash flows from operations and total accruals.

$H_{5,0}$: Contemporaneous stock returns are not related to cash flows from operations and nondiscretionary accruals.

$H_{5,1}$: Contemporaneous stock returns are related to cash flows from operations and nondiscretionary accruals.

$H_{6,0}$: Contemporaneous stock returns are not related to nondiscretionary income and discretionary accruals.

$H_{6,1}$: Contemporaneous stock returns are related to cash flows from operations and nondiscretionary accruals.

$H_{7,0}$: Contemporaneous stock returns are not related to cash flows from operations, nondiscretionary income and nondiscretionary accruals.

$H_{7,1}$: Contemporaneous stock returns are related to cash flows from operations, nondiscretionary income and nondiscretionary accruals.

The second group of hypotheses that are related to the lagged association between stock returns and earnings are presented in their null and alternative form as follows:

$H_{8,0}$: Lagged stock returns are not related to cash flows from operations.

$H_{8,1}$: Lagged stock returns are related to cash flows from operations.

$H_{9,0}$: Lagged stock returns are not related to nondiscretionary income.

$H_{9,1}$: Lagged stock returns are related to nondiscretionary income.

$H_{10,0}$: Lagged stock returns are not related to net income.

$H_{10,1}$: Lagged stock returns are related to net income.

$H_{11,0}$: Lagged stock returns are not related to cash flows from operations and total accruals.

$H_{11,1}$: Lagged stock returns are related to cash flows from operations and total accruals.

$H_{12,0}$: Lagged stock returns are not related to cash flows from operations and nondiscretionary accruals.

$H_{12,1}$: Lagged stock returns are related to cash flows from operations and nondiscretionary accruals.

$H_{13,0}$: Lagged stock returns are not related to nondiscretionary income and discretionary accruals.

$H_{13,1}$: Lagged stock returns are related to nondiscretionary income and discretionary accruals.

$H_{14,0}$: Lagged stock returns are not related to cash flows from operations, nondiscretionary income and discretionary accruals.

$H_{14,1}$: Lagged stock returns are related to cash flows from operations, nondiscretionary income and discretionary accruals.

4.2 SAMPLE AND VARIABLE MEASUREMENT

The sample consists of 115 manufacturing firms listed on the Borsa Istanbul Stock Exchange (BIST) for the period 2008-2015, thus the available sample comprises of 920 firm years. The beginning of the period is selected as 2008 because companies listed on Borsa Istanbul are required to prepare their financial statement according International Financial Reporting Standards since 1 January 2008. The firms included in the sample are only those firms that have all the necessary variables for the observation period. Financial companies are excluded from the sample due to the significantly different nature of their financial statements. Table 4.1 below shows the total number of companies listed in BIST and the number of companies included in the sample. The full list of companies included in the empirical analyses in this thesis is present in the Appendix II to this thesis.

Table 4.1

Number of Companies Included in the Sample

Explanation	**Number of Firms**
Total Number of Companies Listed in Borsa Istanbul as of 2015	423
Number of Companies in the Manufacturing Industry	181
Number of Companies Eliminated from Sample Due to Lack of Information	66
Number of Companies in the Sample	115

The financial statement data, dates of earnings announcements and stock price data required to conduct the research are acquired from Borsa Istanbul. The disclosure dates of the financial statements of the companies listed in Borsa Istanbul (non-financials) are obtained from the website of Borsa Istanbul.

Variables are measured as follows in line with the existing literature. The stock returns are measured as the twelve-month returns that end three months after the end of the fiscal year of the publicly listed company. The measurement of net income data for the publicly listed companies is the earnings before discontinued operations reported in the financial statements that are prepared according to the International Financial Reporting Standards. Operating cash flows is measured as the net operating cash flows presented in the cash flow statements. Accruals are measured as the difference between adjusted net income and operating cash flows. Adjusted net income is earnings before discontinued operations adjusted for other income and loss that are not considered as operating activities. This adjustment assures that all of the difference between the net income and the operating cash flows is attributable to changes in accrual items. The justification for the use of this approach to measure total accruals is the fact that using the balance sheet approach to calculate accruals may lead to non-formulated changes in current assets and current liabilities, which in turn may cause errors in estimating accruals. (Hribar and Collins, 1999) Many of the studies in the literature measure total accruals as the

difference between cash flows from operations and net income. Yet, since some portion of this difference is attributable to investing activities, such as gain or loss on sale of noncurrent assets, the accrual component (the changes in current assets and current liabilities) is calculated after eliminating the effect of these other income or losses from net income. The measurement of net income in this thesis adjusts for the net other income or loss that may be attributable to non-operating activities.

All of the financial statement items are deflated by total assets at the beginning of the period in order to reduce heteroscedasticity. The cross-sectional variation of the modified Jones model by Dechow (1995) is employed in measuring the nondiscretionary accruals. The model estimates nondiscretionary accruals by including the property, plant and equipment, and the difference between changes in revenue and changes in receivables as the explanatory variables in a regression function.

The statistical software programme used in the empirical analyses is Stata 14.2. The variable names, abbreviations and definitions are presented in Table 4.2 below.

Table 4.2

List of Variables

Abbreviation	**Name**	**Explanation**
rev	Net Sales Revenue	Net sales revenue figure reported in the income statement at year *t* for firm *i*
ni	Net Income	Earnings before discontinued operations reported in the income statement at year *t* for firm *i*
cfo	Cash Flows from Operations	Net operating cash flows reported in the cash flow statement at year *t* for firm *i*

Abbreviation	Name	Explanation
ppe	Property, Plant and Equipment, Net	Net property, plant and equipment reported in the balance sheet at year *t* for firm *i*
ta	Total Assets	Total assets reported in the balance sheet at year *t* for firm *i*
other	Other Income or Expenses, Net	Other income or expenses from non-operating activities reported in the cash flow statement at year *t* for firm *i*
ar	Accounts Receivable, Net	Net accounts receivable reported in the balance sheet at year *t* for firm *i*
ret	Annual Stock Return	The annual stock returns covering a twelve-month period that ends three months after the end of the fiscal year *t* of firm *i*
adjni	Adjusted Net Income	Net Income adjusted for net other income and expenses at year *t* for firm *i*
acc	Total Accruals	Total accruals measured as the difference between adjusted net income and cash flows from operations at year *t* for firm *i*
roa	Return on Assets	Net Income divided by total assets at year *t* for firm *i*
ndacc	Nondiscretionary Accruals	Nondiscretionary portion of total accruals measured as the fitted values from the cross-sectional variation of the modified Jones model (Dechow 1995)

Abbreviation	Name	Explanation
dacc	Discretionary Accruals	Discretionary portion of total accruals measured as the difference between total accruals and nondiscretionary accruals
ndi	Nondiscretionary Income	Nondiscretionary portion of earnings measured as the sum of cash flows from operations and nondiscretionary accruals

4.3 PANEL DATA ANALYSIS METHODOLOGY

The data used in this thesis constitutes a panel data as defined by Baltagi as the pooling of observations on a cross section of firms, individuals or households over several time periods. (Baltagi, 2005 p.1) Thus, the methodology includes a panel data analysis of firms listed in Borsa Istanbul for the 2008-2015 period. Using panel data has several benefits. Baltagi (2005) refers to the studies of Hsiao (2003) and Klevmarken (1989) to list some of these benefits as follows (Baltagi, 2005 p.4-6):

- Since panel data assumes that firms are heterogeneous it provides a control for individual heterogeneity.
- Panel data provides more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency.
- Panel data are better at studying multitude of changes.
- Panel data are better at identifying and measuring the effects that are not recognized in pure cross-section or pure time-series data.

A regular regression on panel data employs the following formula:

$$y_{it} = \alpha + X'_{it}\beta + u_{it} \qquad \textit{(Eq. 4.1)}$$

where:

i = 1,…,N firm index, and

t = 1,…,T year index.

Therefore, the subscript i denotes the cross-section dimension of the regression while the subscript t denotes the time-series dimension of the regression. The regression might have K explanatory variables and Kx1 β. (Baltagi 2005, p.11) Baltagi states that the one-way error component model for the disturbances used by many of the panel data applications suggest:

$$u_{it} = \mu_i + \nu_{it} \qquad \textit{(Eq. 4.2)}$$

where:

μ_i = the unobservable individual-specific effect, and

ν_{it} = the remainder disturbance.

There are two models differing in their assumptions in panel data regressions: the fixed effects model and the random effects model. The fixed effects model assumes that the unobservable individual-specific effects (μ_i) are fixed parameters to be estimated and the remainder disturbances that are stochastic with ν_{it} are independent and identically distributed. The fixed effects model is appropriate to use in data, which focuses on a specific set of entities. Thus, the inference of the model is specific to these set of entities. The random effects model on the other hand is a suitable specification to employ in research where a certain number of individuals are randomly selected from a large population. Random effects model assumes that the unobservable individual-specific effects are random, thus avoids the loss of degrees of freedom in the fixed effects model. Since the population is usually large in cases where a sample is selected from a population the fixed effects model may lead to large losses of degrees of freedom. (Baltagi, 2005, p. 14)

Gujarati et al. (2012, p. 606) lists the observations that guide the choice between fixed effects or random effects models. These observations are as follows:

- If the time series data is large and the cross-sectional data is small, then the coefficients that will be estimated by the fixed effects or the random effects

models will be similar. Therefore, the choice here depends on the ease of calculation, which makes the fixed effects model a more appropriate choice.

- If the times series data is small and the cross-sectional data is large, then the two methods may provide significantly different estimations. In this case, if the cross-sectional data is not selected randomly out of a large population, then the fixed effects model is a more appropriate choice.
- If the error term of the cross-sectional data and one or more independent variables are correlated, then the random effects model will provide biased results whereas the fixed effects model will provide unbiased results.
- If the times series data is small, the cross-sectional data is large and the assumptions of the random effects model is valid, then the random effects estimators are more efficient than the fixed effects estimators.

Brooks (2008) points out random effects is considered more appropriate compared to fixed effects for samples of entities selected randomly out of a population, whereas the fixed effects model is considered more appropriate for samples of entities that comprise all of the entities listed on a stock exchange. Although the transformation involved in random effects model does not remove the explanatory variables that do not vary over time and there are fewer parameters to be estimated saving degrees of freedom; the pitfall of the model is that it is valid when the composite error term is uncorrelated with all of the explanatory variables. (Brooks 2008 p. 500)

As Dougherty (2001) states, if the measurement error in an economic data is significant enough then the use of ordinary least squares (OLS) to fit a model is risky since the OLS estimates will be inconsistent. However, if the measurement error is not significant both of the approaches will be consistent and one should prefer OLS because it is a more efficient approach. He suggests the use of Durbin-Wu-Hausman specification test (usually described as Hausman test due to the main reference to Hausman (1978) with important contributions from Durbin (1954) and Wu (1973)) to make an informed choice between two options.

The null hypothesis of the Hausman test is that the random effects and fixed effects estimates are close enough to prefer one model over the other, or the sampling variation is so

large in the estimates of the fixed effects model that significant differences are not concluded to be statistically significant. Thus, if the test results in the rejection of the null hypothesis then it means that the key random effects assumption is false and one should choose the fixed effects estimates. (Woolridge, 2016, p. 444)

4.3.1 Model Specification for the Discretionary Accruals

The most powerful model to date in measuring discretionary accruals is stated as the modified Jones model (Dechow, 1995 and Guay, 1996) Kothari et al. (2005) state that the Jones models are not suitable for samples that are mostly made of high performance firms. They recommend the use of a performance matched model instead. As Keung and Shih conclude in their 2014 study, where they evaluate the discretionary accrual models, the performance matching models should be used with caution even in samples that are skewed towards high performance firms. The authors state that while the performance matched models are used as a standard procedure, the performance matched models are not beneficial when the skewness in the sample is caused by operating results of the firms rather than by earnings management. The test results for the sample in this thesis indicates as shown in Table 4.3 and the histogram graphic (Figure 4.1) below that the sample is not skewed, therefore the performance matched models are not employed in this study.

Table 4.3

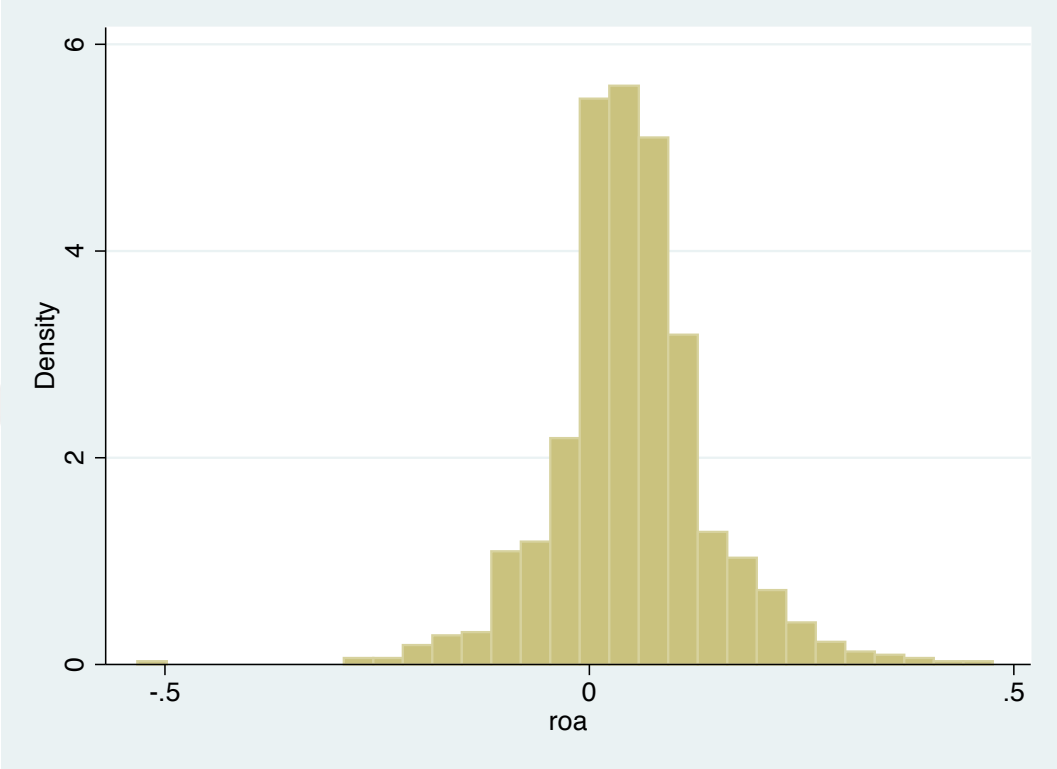
Skewness/Kurtosis Tests for Normality

Variable	Observations	Skewness	Kurtosis	Adj. Chi^2	Prob.>Chi^2
roa	920	0.6660	0.0000	62.76	0.0000

Figure 4.1 below presents the histogram of normality for the return on assets measure of the companies included in the analyses. The histogram presentation is in line with the skewness/kurtosis test results presented in the table above for the sample in this thesis, which leads to the conclusion that the sample is not skewed towards high performance companies.

Figure 4.1

Histogram of Normality



Due to the aforementioned reasons the model used in this thesis for the estimation of discretionary accruals is the cross-sectional variation of the modified Jones model. All variables are scaled by total assets to reduce heteroscedasticity. The model is as follows:

$$\frac{ACC_{it}}{TA_{it-1}} = \alpha_1 \left(\frac{1}{TA_{it-1}}\right) + \alpha_2 \left[\frac{(\Delta REV_{it} - \Delta REC_{it})}{TA_{it-1}}\right] + \alpha_3 \left(\frac{PPE_{it}}{TA_{it-1}}\right) + e_{it} \qquad \textit{(Eq. 4.3)}$$

where

ACC = total accruals;

TA = total assets;

ΔREV = changes in revenues;

ΔREC = changes in receivables;

PPE = gross property, plant and equipment;

t = the year subscript for the period 2008-2015 (inclusive);

i = the firm subscript.

The nondiscretionary accruals are measured as the fitted values from the above equation.

$$NDACC_{it} = \hat{\alpha}_1 \left(\frac{1}{TA_{it-1}}\right) + \hat{\alpha}_2 \left[\frac{(\Delta REV_{it} - \Delta REC_{it})}{TA_{it-1}}\right] + \hat{\alpha}_3 \left(\frac{PPE_{it}}{TA_{it-1}}\right) \quad (Eq.\ 4.4)$$

where

NDACC = nondiscretionary accruals;

all the other variables are as defined as before.

The fitted values from the model constitute the nondiscretionary accruals variable that will be utilized as an independent variable in the returns-earnings regression analyses. The discretionary accruals are defined as the residual from the above equation:

$$DACC_{it} = ACC_{it} / TA_{it-1} - NDACC_{it} \quad (Eq.\ 4.5)$$

where

DACC = discretionary accruals;

all the other variables are as defined as before.

4.3.2 Model Specifications for Returns-Earnings Regressions

To investigate whether the market prices the discretionary and nondiscretionary components of earnings the discretionary and nondiscretionary components of earnings are regressed against contemporaneous and lagged stock returns and the effect of accruals on two levels (nondiscretionary and discretionary accruals) are examined on both the coefficient and the explanatory power of the models.

Returns are regressed on the levels of earnings consistent with the existing literature. Ohlson concludes in his 1992 study that the earnings levels variable serves as the natural

starting point in explaining returns. If neither the returns variable nor the earnings levels variable is predictable, then the earnings levels variable must be the variable with the maximum R^2 and the most powerful explanatory variable and "This simple fact appears central and inescapable when one tries to explain returns." (Ohlson 1992, p. 225) Ohlson states that Kothari and Sloan (1992) provides theoretical and Easton and Harris (1991) provides empirical support for the conclusion that earnings levels are superior to earnings changes. Easton and Harris show in their 1991 paper that both levels of earnings levels and changes in earnings as deflated by beginning-of-period stock price have explanatory power when they are included simultaneously in a regression of annual stock returns on earnings. Ali and Zarowin (1992, p. 295) also conclude that the explanatory power of the earnings level variable is consistent with the presence of transitory components in annual earnings. They state that including earnings levels as the independent variable increases the explanatory power materially.

Following the methodology employed by Dechow (1994) and Subramanyam (1996), univariate regressions on different firm performance measures (cash flows, nondiscretionary earnings and net income) and stock returns are estimated. Assuming that the accrual accounting increases informativeness of earnings, the coefficient and the explanatory power of the regression model that includes nondiscretionary income as the independent variable should be higher than the model that includes cash flows as the independent variable. And if, managerial discretion increases the value relevance of earnings as implied by stock returns then the coefficient and the explanatory power of the regression model that includes net income as the independent variable should be higher than the model that includes nondiscretionary income as the independent variable. Then, multivariate regressions on returns and multiple earnings components are estimated. As an addition to the methodology employed by the studies that employ contemporaneous stock returns as the dependent variable, the models in the first group in this thesis employs contemporaneous stock returns and the second group employs lagged stock returns as the dependent variable to investigate the post earnings announcement drift.

Following the methodology in Subramanyam (1996) the first, second and third models include contemporaneous stock returns as the dependent variable and cash flows from operations, nondiscretionary income and net income as the independent variables, respectively. The fourth to seventh models are multivariate regression models. The fourth model includes

stock returns as the dependent variable and operating cash flows and total accruals as the independent variables. The fifth model includes stock returns as the dependent variable and operating cash flows and nondiscretionary accruals as the independent variables. The sixth model includes stock returns as the dependent variable and nondiscretionary income and discretionary accruals as the independent variables. The seventh model includes stock returns as the dependent variable and operating cash flows, nondiscretionary income and discretionary accruals as the independent variables. Table 4.4 below summarizes the variables of the models.

Table 4.4

Models of Regressions of Contemporaneous Stock Returns vs. Earnings and Components of Earnings

Model	**Dependent Variable**	**Independent Variable(s)**
Model C1	Stock Returns$_t$	Cash Flows from Operations$_t$
Model C2	Stock Returns$_t$	Nondiscretionary Income$_t$
Model C3	Stock Returns$_t$	Net Income$_t$
Model C4	Stock Returns$_t$	Cash Flows from Operations$_t$ and Total Accruals$_t$
Model C5	Stock Returns$_t$	Cash Flows from Operations$_t$ and Nondiscretionary Accruals$_t$
Model C6	Stock Returns$_t$	Nondiscretionary Income$_t$ and Discretionary Accruals$_t$
Model C7	Stock Returns$_t$	Cash Flows from Operations$_t$, Nondiscretionary Income$_t$ and Discretionary Accruals$_t$

The models are presented in equation form below:

Model C1: $ret_{it} = \alpha_1 + \beta_1 cfo_{it} + u_{it}$ *(Eq. 4.6)*

where;

ret_{it} = annual stock returns for firm i at year t,

cfo_{it} = operating cash flows for firm i at year t,

u_{it} = error term.

Model C2: $ret_{it} = \alpha_1 + \beta_1 ndi_{it} + u_{it}$ *(Eq. 4.7)*

where;

ndi_{it} = nondiscretionary income for firm i at year t, and

all the other variables are as defined as before.

Model C3: $ret_{it} = \alpha_1 + \beta_1 ni_{it} + u_{it}$ *(Eq. 4.8)*

where;

ni_{it} = nondiscretionary income for firm i at year t, and

all the other variables are as defined as before.

Model C4: $ret_{it} = \alpha_1 + \beta_1 cfo_{it} + \beta_2 acc_{it} + u_{it}$ *(Eq. 4.9)*

where;

acc_{it} = total accruals for firm i at year t, and

all the other variables are as defined as before.

Model C5: $ret_{it} = \alpha_1 + \beta_1 cfo_{it} + \beta_2 ndi_{it} + u_{it}$ *(Eq. 4.10)*

where all the variables are as defined as before.

Model C6: $ret_{it} = \alpha_1 + \beta_1 ndi_{it} + \beta_2 dacc_{it} + u_{it}$ *(Eq. 4.11)*

where;

$dacc_{it}$ = discretionary accruals for firm i at year t, and

all the other variables are as defined as before.

Model C7: $ret_{it} = \alpha_1 + \beta_1 cfo_{it} + \beta_2 ndi_{it} + \beta_3 dacc_{it} + u_{it}$ *(Eq. 4.12)*

where all the variables are as defined as before.

To test the explanatory power of earnings and the incremental explanatory power of its components on lagged stock returns the first group of models in this study include univariate regressions as in the case of contemporaneous regression models. As an addition to the methodology in Subramanyam (1996) the first, second and third models include lagged stock returns (stock returns at t-1) as the dependent variable and cash flows from operations, nondiscretionary income and net income as the independent variables, respectively. The fourth to seventh models are multivariate regression models. The fourth model includes lagged stock returns as the dependent variable and operating cash flows and total accruals as the independent variables. The fifth model includes lagged stock returns as the dependent variable and operating cash flows and nondiscretionary accruals as the independent variables. The sixth model includes lagged stock returns as the dependent variable and nondiscretionary income and discretionary accruals as the independent variables. The seventh model includes lagged stock returns as the dependent variable and operating cash flows, nondiscretionary income and discretionary accruals as the independent variables. Table 4.5 below summarizes the variables of the models.

Table 4.5

Models of Regressions of Stock Returns vs. Lagged Earnings and Components of Earnings

Model	Dependent Variable	Independent Variable(s)
Model L1	Stock Returns$_t$	Cash Flows from Operations$_{t-1}$
Model L2	Stock Returns$_t$	Nondiscretionary Income $_{t-1}$
Model L3	Stock Returns$_t$	Net Income $_{t-1}$
Model L4	Stock Returns$_t$	Cash Flows from Operations $_{t-1}$ and Total Accruals $_{t-1}$
Model L5	Stock Returns$_t$	Cash Flows from Operations $_{t-1}$ and Nondiscretionary Accruals $_{t-1}$
Model L6	Stock Returns$_t$	Nondiscretionary Income $_{t-1}$ and Discretionary Accruals $_{t-1}$
Model L7	Stock Returns$_t$	Cash Flows from Operations $_{t-1}$, Nondiscretionary Income $_{t-1}$ and Discretionary Accruals $_{t-1}$

The models are presented in equation form below:

Model L1: $ret_t = \alpha_1 + \beta_1 cfo_{it-1} + u_{it}$ *(Eq. 4.13)*

where;

ret_t = annual stock returns for firm i at year t,

cfo_{it-1} = operating cash flows for firm i at year t-1,

u_{it} = error term.

Model L2: $ret_t = \alpha_1 + \beta_1 ndi_{it-1} + u_{it}$ *(Eq. 4.14)*

where;

ndi_{it-1} = nondiscretionary income for firm i at year t-1, and

all the other variables are as defined as before.

Model L3: $ret_t = \alpha_1 + \beta_1 ni_{it-1} + u_{it}$ *(Eq. 4.15)*

where;

ni_{it-1} = nondiscretionary income for firm i at year t-1, and

all the other variables are as defined as before.

Model L4: $ret_t = \alpha_1 + \beta_1 cfo_{it-1} + \beta_2 acc_{it-1} + u_{it}$ *(Eq. 4.16)*

where;

acc_{it-1} = total accruals for firm i at year t-1, and

all the other variables are as defined as before.

Model L5: $ret_t = \alpha_1 + \beta_1 cfo_{it-1} + \beta_2 ndi_{it-1} + u_{it}$ *(Eq. 4.17)*

where all the variables are as defined as before.

Model L6: $ret_t = \alpha_1 + \beta_1 ndi_{it-1} + \beta_2 dacc_{it-1} + u_{it}$ *(Eq. 4.18)*

where;

$dacc_{it-1}$ = discretionary accruals for firm i at year t-1, and

all the other variables are as defined as before.

Model L7: $ret_t = \alpha_1 + \beta_1 cfo_{it-1} + \beta_2 ndi_{it-1} + \beta_3 dacc_{it-1} + u_{it}$ *(Eq. 4.19)*

where all the variables are as defined as before.

Section 5 below performs the empirical analysis and reports the results of the analysis.

5 RESEARCH FINDINGS

This section of the thesis presents the summary descriptive statistics of the data utilized and the models developed to test the hypotheses.

5.1 SUMMARY STATISTICS

Table 5.1 below presents the summary descriptive statistics of the variables used in the analyses. The results indicate that total accruals are close to zero on average, which is also the case for nondiscretionary accruals. The negative values for total and nondiscretionary accruals in the sample is caused by depreciation. The variance in total assets show that the sample consists of firms that are of various sizes. Therefore, to reduce the effect of size all of the variables are scaled by lagged total assets. Discretionary accruals have a mean close to zero. Their variance is more than nondiscretionary accruals but less than total accruals. These findings are consistent with existing literature. The variance of discretionary accruals is higher than that of net income. The lower variance in net income may be caused by the negative correlations across its components or the variance of discretionary accruals may be increased by the measurement error in the model that is used to measure them. (Subramanyam, 1996 p. 256) Mean return on assets is positive with a standard deviation of 0.092. Figure 4.1 indicates that the variable is normally distributed, thus the sample is not skewed through high performance or low performance firms.

Table 5.1

Descriptive Statistics of the Variables

Variable Abbreviation	Obs.	Mean	Std. Dev.	Min.	Max.
acc	920	0.024	0.150	-1.408	1.621
rev	920	1.046	0.538	0.001	5.064
ar	920	0.225	0.150	0.000	1.467
ppe	920	0.408	0.225	0.004	2.253
ta	920	1196.424	2762.332	11.946	25470.120
other	920	0.010	0.125	-1.512	1.363
adjni	920	0.068	0.150	-1.401	1.463
cfo	920	0.092	0.134	-0.625	1.450
ndi	920	0.116	0.135	-0.570	1.458
ni	920	0.058	0.111	-0.502	0.717
ndacc	920	0.024	0.019	-0.100	0.129
dacc	920	0.000	0.149	-1.418	1.627
roa	920	0.049	0.092	-0.533	0.475
ret	920	0.290	0.949	-0.835	15.755

The variables total accruals (acc), net sales revenue (rev), accounts receivable, net (ar), property, plant and equipment, net (ppe), other income or expenses, net (other), adjusted net income (adjni), cash flows from operations (cfo), net income before discontinued operations (ni) are all scaled by lagged total assets.

Table 5.2 below presents the Pearson correlation coefficients between the variables utilized in the empirical study. The results suggest that there is high but not perfect correlation between total accruals (acc) and discretionary accruals (dacc); nondiscretionary accruals (ndacc) and property plant and equipment, net (ppe); adjusted net income (adjni) and other income or loss, net (other); discretionary accruals (dacc) and other income or loss, net (other); net income (ni) and adjusted net income (adjni); discretionary accruals (dacc) and adjusted net

income (adjni); return on assets (roa) and adjusted net income (adjni); cash flows from operations (cfo) and nondiscretionary income (ndi); and net income (ni) and return on assets (roa).

The only variable pair that have a high correlation and included contemporaneously in the same regression model consists of cash flow from operations and nondiscretionary income. The other variable pairs are not employed as independent variables in the same model.

Table 5.2

Correlation Matrix for Variables

	acc	rev	ar	ppe	ta	other	adjni	cfo	ndi	ni	ndacc	dacc	roa	ret
acc	1.0000													
rev	-0.0769	1.0000												
ar	-0.1841	0.5249	1.0000											
ppe	0.0645	-0.0430	-0.2186	1.0000										
ta	0.0314	0.1287	-0.1208	0.0164	1.0000									
other	-0.6140	0.0614	0.0575	0.0668	-0.0066	1.0000								
adjni	-0.5999	0.2282	0.0869	0.0378	0.0317	0.6876	1.0000							
cfo	0.4463	0.1693	-0.1085	0.1144	0.0705	0.0830	0.4482	1.0000						
ndi	0.4632	0.1081	-0.1540	0.1860	0.0770	0.0817	0.4224	0.9900	1.0000					
ni	-0.1204	0.2391	0.0527	-0.0240	0.0502	-0.1949	0.5782	0.5122	0.4788	1.0000				
ndacc	0.1270	-0.4298	-0.3232	0.5082	0.0478	-0.0079	-0.1745	-0.0532	0.0885	-0.2268	1.0000			
dacc	0.9919	-0.0225	-0.1442	0.0000	0.0255	-0.6180	-0.5825	0.4567	0.4556	-0.0924	0.0000	1.0000		
roa	-0.1014	0.1674	0.0066	-0.1237	0.0421	-0.2049	0.5356	0.4858	0.4579	0.9537	-0.1881	-0.0782	1.0000	
ret	-0.0101	0.0753	0.0333	0.0964	0.0092	0.0046	0.0816	0.0799	0.0695	0.1050	-0.0718	-0.0010	0.0693	1.0000

5.2 RESULTS OF THE PANEL DATA ANALYSIS

The main aim of the empirical part of this thesis is to investigate the explanatory power of earnings information and its components on stock returns on a contemporaneous and lagged level. In order to examine the explanatory power of earnings and its components on stock returns, first of all the earnings are decomposed to its cash flow and accrual components. Then, the accruals component is further decomposed into its nondiscretionary and discretionary components. The measurement of cash flows is straightforward as stated in the data and variable measurement section. However, the measurement of discretionary and nondiscretionary accruals requires the estimation of an econometric model.

The first subsection in this section documents the estimation results of the cross-sectional variation of the modified Jones model by Dechow (1995). The second subsection presents the estimation results of the univariate and multivariate regression analyses of stock returns against earnings components on a contemporaneous level. The third subsection presents the estimation results of the univariate and multivariate regression analyses of stock returns against earnings components on a lagged level.

5.2.1 The Discretionary Accruals Model

The cross-sectional variation of the modified Jones model by Dechow (1995) is utilized to estimate the discretionary accruals for each firm-year in the analysis. The dependent variable of the model is total accruals, the independent variables are 1/total $assets_{i, t-1}$, difference between changes in revenues and changes in accounts receivables and the property, plant and equipment. The estimation method is selected based on the Hausman test. The Hausman test results for the cross-sectional variation of the Jones model are presented in Table 5.3 below. The test results indicate an insignificant chi-square value, which implies that the null hypothesis of no difference between the coefficient estimates is not rejected, therefore the fixed effects model is rejected in favour of the random effects model.

Table 5.3

Hausman Test Results for the Discretionary Accruals Model

	Coefficients			
	Fixed Effects	**Random Effects**	**Difference**	**Standard Error**
scale	-0.2431998	-0.6152966	0.3720969	1.283441
revch_arch_sc	-0.0610198	-0.0661648	0.005145	0.0095743
ppe_sc	0.0344037	0.0545538	-0.02015	0.0281858
chi^2	0.71			
Prob>chi^2	0.8712			

The independent variables are scale (1/Total $Assets_{i,t-1}$), revch_arch_sc (the difference between changes in revenues and changes in receivables for period t and firm i scaled by lagged total assets) and ppe_sc (property, plant and equipment for period t and firm i scaled by lagged total assets). The dependent variable is acc_sc (total accruals scaled by lagged total assets for period t and firm i).

The random effects generalized least squares regression results of the cross-sectional variation of the modified Jones model estimation are presented in Table 5.4 below. The option robust is added to control for heteroscedasticity. The test results are significant at $p<0.01$ level. However, the predicted signs of the two coefficients are different with the existing literature. The predicted sign of the difference between the change in revenues and change in receivables is positive and the predicted sign of the property, plant and equipment is negative. However, both coefficients are not significant at $p<0.01$ level. Thus, this result is ignored for practical purposes, since the variables are statistically insignificant. (Woolridge 2016, p.122)

Table 5.4

The Random Effects GLS Robust Test Results for the Discretionary Accruals Model

Dependent Variable : acc_sc	
Explanatory Variables	**Estimated Coefficients (z-value)**
scale	-0.6152966
	(-1.7)*
revch_arch_sc	-0.0661648
	(-1.55)
ppe_sc	0.0545538
	(2.01)**
constant	0.0101142
	(0.72)*
Number of observations	920
Number of groups	115
Wald chi^2	13.01
Prob>chi^2	0.0046
Goodness of Fit (R^2)	0.0161
legend	**p<0.10; **p<0.05; ***p<0.01*

The independent variables are scale (1/Total Assetsi,t-1), revch_arch_sc (the difference between changes in revenues and changes in receivables for period t and firm i scaled by lagged total assets) and ppe_sc (property, plant and equipment for period t and firm i scaled by lagged total assets). The dependent variable is acc_sc (total accruals scaled by lagged total assets for period t and firm i).

5.2.2 Regressions of Contemporaneous Stock Returns on Earnings and Components of Earnings

To test the explanatory power of earnings and the incremental explanatory power of its components on contemporaneous stock returns the first group of models in this study include univariate regressions of earnings components on stock returns.

The estimation methods for the models above are selected based on the Hausman test. The Hausman test results for the models are presented in Table 5.5 below. When the test results indicate an insignificant chi-square value, which implies that the null hypothesis of no difference between the coefficient estimates is not rejected, the fixed effects model is rejected in favour of the random effects model; when the chi-square value is significant fixed effects model is preferred instead of the random effects model. According to Hausman test results all of the models are estimated using random effects Generalized Least Squares (GLS) regression.

Table 5.5

Hausman Test Results for the Contemporaneous Returns-Earnings Regressions

Model	**Hausman Test Results**		**Estimation Method**
	Chi-Square Statistic	**Prob.>Chi-Square**	
Model C1	0.00	0.9867	Random Effects
Model C2	0.08	0.7825	Random Effects
Model C3	2.96	0.0855	Random Effects
Model C4	0.35	0.8408	Random Effects
Model C5	5.95	0.0511	Random Effects
Model C6	0.95	0.6222	Random Effects
Model C7	6.68	0.0829	Random Effects

The dependent variable in all models is compound annual stock returns, measured over the twelve-month period ending three months after the fiscal year end. The independent variables are cash flows from operations (cfo), nondiscretionary income (ndi), net income (ni), total accruals (acc), nondiscretionary accruals (ndacc) and discretionary accruals (dacc). All independent variables are scaled by lagged total assets. Nondiscretionary and discretionary accruals are measured using the cross-sectional variation of the modified Jones model. Nondiscretionary income is the sum of cash flows from operations scaled by lagged total assets and nondiscretionary accruals. Figures in parentheses indicate the z statistics of the coefficients.

Table 5.6 below presents the results for Model C1 as defined by Eq. 4.6, which includes cash flows from operations as the explanatory variable, indicate that the model is statistically significant at 0.05 level (prob>chi-square = 0.0151). The coefficient of the explanatory variable (cash flows from operations) is 0.56 (prob>|z| = 0.015). A within R-squared of 0.48% implies that the model accounts for 0.48% of the variance within the panel units; a between R-squared of 2.51% implies that the model accounts for 2.51% of the variance between individual panel units and the overall R-squared is a weighted average of the within and between R-squared values, which is 0.64%.

Table 5.6

Panel Data Analysis Results of Model C1

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
cfo	0.5647962
	(2.43)**
constant	0.2381718
	(6.29)***
Number of observations	920
Number of groups	115
Wald chi^2	5.9
Prob>chi^2	0.0151
Goodness of Fit (R^2)	0.0064
legend	**p<0.10; **p<0.05; ***p<0.01*

Table 5.7 below presents the results for Model C2 as defined by Eq. 4.7, which includes nondiscretionary income as the explanatory variable, also indicate that the model is statistically significant at 0.05 level (prob>chi-square = 0.0347). The coefficient of the explanatory variable (nondiscretionary income) is 0.49 (prob>|z| = 0.035). The R-squared of Model C2 is lower than that of Model C1. The coefficient of nondiscretionary income is also lower than that of cash flows from operations. This implies that cash flows from operations are more value relevant than nondiscretionary accrual information.

Table 5.7

Panel Data Analysis Results of Model C2

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
ndi	0.4902645
	(2.11)**
constant	0.2334157
	(5.66)***
Number of observations	920
Number of groups	115
Wald chi^2	4.46
Prob>chi^2	0.0347
Goodness of Fit (R^2)	0.0048
legend	**p<0.10; **p<0.05; ***p<0.01*

Table 5.8 below presents the results for Model C3 as defined by Eq. 4.8, which includes net income as the explanatory variable, indicate that the model is significant at p.<0.01 level. The R-squared is 1.10% and the coefficient is 0.90, which is also significant at the 0.01 level. Net income explains the highest portion of contemporaneous stock returns as evidenced by the highest coefficient and the highest R-squared. The results of the univariate regressions indicate that net income is the most value relevant explanatory variable and market attaches value to total accruals as suggested by Dechow (1994) and Subramanyam (1996).

Table 5.8

Panel Data Analysis Results of Model C3

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
ni	0.8958808
	(2.11)***
constant	0.238156
	(6.78)***
Number of observations	920
Number of groups	115
Wald chi^2	10.23
Prob>chi^2	0.0014
Goodness of Fit (R^2)	0.0110
legend	**p<0.10; **p<0.05; ***p<0.01*

The fourth to seventh models are multivariate models that examine the informativeness of earnings components by regressing contemporaneous stock returns on two or more components of earnings. The fourth model has two explanatory variables: cash flows from operations and total accruals. Table 5.9 below presents the results for Model C4 as defined by Eq. 4.9. This model is significant at 5% level (prob>chi-square = 0.0155). The model has a higher R-squared (0.90%) compared to the model which includes cash flows from operations as the sole explanatory variable (0.64%). However, the total accruals coefficient is not significant at 5% level (P>|z| = 0.12). Also, the sign of the total accruals variable is not the same as the predicted sign, however, this is ignored since the variable is not significant.

Table 5.9

Panel Data Analysis Results of Model C4

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
cfo	0.7451729
	(2.87)***
acc	-0.3617349
	(-1.56)
constant	0.2301357
	(6.03)***
Number of observations	920
Number of groups	115
Wald chi^2	8.33
Prob>chi^2	0.0155
Goodness of Fit (R^2)	0.0090
legend	**p<0.10; **p<0.05; ***p<0.01*

The fifth model has two explanatory variables: cash flows from operations and nondiscretionary accruals, which in total make up the nondiscretionary income. Table 5.10 below presents the results for Model C5 as defined by Eq. 4.10. This model is significant at 1% level (prob>chi-square = 0.0062). The model has a higher R-squared (1.10%) compared to the model which includes cash flows from operations as the sole explanatory variable (0.64%). However, the nondiscretionary accruals coefficient is not significant at 1% level (P>|z| = 0.039). Also, the sign of the nondiscretionary accruals variable is not the same as the predicted sign, however, this is ignored since the variable is not significant at 1%.

Table 5.10

Panel Data Analysis Results of Model C5

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
cfo	0.5393073
	(2.32)**
ndacc	-3.375433
	(-2.06)**
constant	0.3205137
	(5.83)***
Number of observations	920
Number of groups	115
Wald chi^2	10.17
Prob>chi^2	0.0062
Goodness of Fit (R^2)	0.0110
legend	**p<0.10; **p<0.05; ***p<0.01*

The sixth model has two explanatory variables: nondiscretionary income and discretionary accruals. Table 5.11 below presents the results for Model C6 as defined by Eq. 4.11. The model is not significant at 5% (prob>chi-square = 0.0576). The explanatory power of the model is lower than the model which includes nondiscretionary income as the sole explanatory variable, which leads to the conclusion that discretionary accruals do not have incremental explanatory power over nondiscretionary income assuming that the modified Jones model (1995) measures discretionary accruals accurately.

Table 5.11

Panel Data Analysis Results of Model C6

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
ndi	0.6227987
	(2.39)**
dacc	-0.263144
	(-1.12)
constant	0.2180711
	(5.02)***
Number of observations	920
Number of groups	115
Wald chi^2	5.71
Prob>chi^2	0.0576
Goodness of Fit (R^2)	0.0062
legend	**p<0.10; **p<0.05; ***p<0.01*

The last multivariate regression model has three explanatory variables: cash flows from operations, nondiscretionary income and discretionary accruals. Table 5.12 below presents the results for Model C7 as defined by Eq. 4.12. The model is significant at 1% level (prob>chi-square = 0.0085). This model has the highest explanatory power among the contemporaneous models as measured by its R-squared (1.26%).

Table 5.12

Panel Data Analysis Results of Model C7

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
cfo	4.006524
	(2.44)**
ndi	-3.320385
	(-2.03)**
dacc	-0.2892485
	(-1.23)
constant	0.305689
	(5.43)***
Number of observations	920
Number of groups	115
Wald chi^2	11.68
Prob>chi^2	0.0085
Goodness of Fit (R^2)	0.0126
legend	**p<0.10; **p<0.05; ***p<0.01*

Table 5.13 below summarizes the results of the regression estimates of contemporaneous stock returns vs. earnings and components of earnings.

Table 5.13

Summary Results of Regressions of Stock Returns on Earnings and Components of Earnings

	Intercept	cfo	ndi	ni	acc	ndacc	dacc	R^2
Model C1	0.2381718 (6.29)***	0.5647962 (2.43)**						0.64%
Model C2	0.2334157 (5.66)***		0.4902645 (2.11)**					0.48%
Model C3	0.238156 (6.78)***			0.8958808 (3.20)***				1.10%
Model C4	0.2301357 (6.03)***	0.7451729 (2.87)***			-0.3617349 (-1.56)			0.90%
Model C5	0.3205137 (5.83)***	0.5393073 (2.32)**				-3.375433 (-2.06)**		1.10%
Model C6	0.2180711 (5.02)***		0.6227987 (2.39)**				-0.263144 (-1.12)	0.06%
Model C7	0.305689 (5.43)***	4.006524 (2.44)**	-3.320385 (-2.03)**				-0.2892485 (-1.23)	1.26%

*Legend: *p<0.10; **p<0.05; ***p<0.01*

5.2.3 Regressions of Lagged Stock Returns on Earnings and Its Components

The first group of the models include certain components of earnings as the independent variables against contemporaneous stock returns; the second group of models include certain lagged components of earnings against stock returns.

The estimation methods for the lagged models defined above are selected based on the Hausman test. The Hausman test results for the models are presented in Table 5.14 below. When the test results indicate an insignificant chi-square value, which implies that the null hypothesis of no difference between the coefficient estimates is not rejected, the fixed effects model is rejected in favour of the random effects model; when the chi-square value is significant fixed effects model is preferred instead of the random effects model. According to Hausman test results all of the models are estimated using random effects Generalized Least Squares (GLS) regression.

Table 5.14

Hausman Test Results for the Lagged Returns-Earnings Regressions

Model	Hausman Test Results		Estimation Method
	Chi-Square Statistic	Prob.>Chi-Square	
Model L1	2.37	0.1236	Random Effects
Model L2	2.81	0.0938	Random Effects
Model L3	0.73	0.3929	Random Effects
Model L4	2.41	0.2999	Random Effects
Model L5	3.54	0.1701	Random Effects
Model L6	3.00	0.2236	Random Effects
Model L7	3.63	0.3043	Random Effects

The dependent variable in all models is compound annual stock returns, measured over the twelve-month period ending three months after the fiscal year end. The independent variables are lagged cash flows from operations (l.cfo), lagged nondiscretionary income (l.ndi), lagged net income (l.ni), lagged total accruals (l.acc), lagged nondiscretionary accruals (l.ndacc) and lagged discretionary accruals (l.dacc), all of which are lagged one year. All independent variables are scaled by lagged total assets. Nondiscretionary and discretionary accruals are measured using the cross-sectional variation of the modified Jones model. Nondiscretionary income is the sum of cash flows from operations scaled by lagged total assets and nondiscretionary accruals. Figures in parentheses indicate the z statistics of the coefficients.

Table 5.15 below presents the results for Model L1 as defined by Eq. 4.13, which includes lagged cash flows from operations as the explanatory variable, indicate that the model

is statistically significant at 0.01 level (prob>chi-square = 0.0000). The coefficient of the explanatory variable (cash flows from operations) is 1.04 (prob>|z| = 0.000).

Table 5.15

Panel Data Analysis Results of Model L1

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.cfo	1.037686
	(4.19)***
constant	0.2290045
	(5.67)***
Number of observations	805
Number of groups	115
Wald chi^2	17.54
Prob>chi^2	0.0000
Goodness of Fit (R^2)	0.0214
legend	**p<0.10; **p<0.05; ***p<0.01*

Table 5.16 below presents the results for Model L2 as defined by Eq. 4.14, which includes lagged nondiscretionary income as the explanatory variable, also indicate that the model is statistically significant at 0.01 level (prob>chi-square = 0.0000). The coefficient of the explanatory variable (nondiscretionary income) is 1.09 (prob>|z| = 0.000).

Table 5.16

Panel Data Analysis Results of Model L2

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.ndi	1.087018
	(4.40)***
constant	0.1996137
	(4.57)***
Number of observations	805
Number of groups	115
Wald chi^2	19.34
Prob>chi^2	0.0000
Goodness of Fit (R^2)	0.0235
legend	**p<0.10; **p<0.05; ***p<0.01*

Table 5.17 below presents the results for Model L3 as defined by Eq. 4.15, which includes lagged net income as the explanatory variable, indicate that the model is significant at p.<0.10 level. The R-squared is 0.38% and the coefficient is 0.53, which is also significant at the 0.10 level. The results indicate that although cash flows and nondiscretionary accruals explain stock returns, discretionary accruals introduce distortion in the explanatory power of earnings as evidenced by the decrease in the R-squared and the coefficient of net income.

Table 5.17

Panel Data Analysis Results of Model L3

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.ni	0.5328522
	(1.74)*
constant	0.2924515
	(7.69)***
Number of observations	805
Number of groups	115
Wald chi^2	3.04
Prob>chi^2	0.0810
Goodness of Fit (R^2)	0.0038
legend	**p<0.10; **p<0.05; ***p<0.01*

The fourth to seventh models are multivariate regression models that examine the informativeness of earnings components by regressing stock returns on two or more lagged components of earnings. Table 5.18 below presents the results for Model L4 as defined by Eq. 4.16, which has two explanatory variables: lagged cash flows from operations and lagged total accruals. This model is significant at 1% level (prob>chi-square = 0.0001). The model has a higher R-squared compared to the model which includes lagged cash flows from operations as the sole explanatory variable. However, the total accruals coefficient is not significant at 5% level (P>|z| = 0.29).

Table 5.18

Panel Data Analysis Results of Model L4

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.cfo	0.9026903
	(3.24)***
l.acc	0.26493
	(1.06)
constant	0.2346245
	(5.76)***
Number of observations	805
Number of groups	115
Wald chi^2	18.67
Prob>chi^2	0.0001
Goodness of Fit (R^2)	0.0227
legend	**p<0.10; **p<0.05; ***p<0.01*

Table 5.19 below presents the results for Model L5 as defined by Eq. 4.17, which has two explanatory variables: cash flows from operations and nondiscretionary accruals, which in total make up the nondiscretionary income. This model is significant at 1% level (prob>chi-square = 0.0000). The model has a higher R-squared (2.52%) compared to the model which includes cash flows from operations as the sole explanatory variable and also compared to the model which includes lagged cash flow from operations and lagged total accruals as explanatory variables. This result is in harmony with the finding that discretionary accruals introduce distortion to the usefulness of earnings in explaining the values of stock prices. The nondiscretionary accruals coefficient is significant at 10% level (P>|z| = 0.077).

Table 5.19

Panel Data Analysis Results of Model L5

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.cfo	1.063962
	(4.29)***
l.ndacc	3.122674
	(1.77)*
constant	0.1549435
	(2.66)***
Number of observations	805
Number of groups	115
Wald chi^2	20.70
Prob>chi^2	0.0000
Goodness of Fit (R^2)	0.0252
legend	**p<0.10; **p<0.05; ***p<0.01*

Table 5.20 below presents the results for Model L6 as defined by Eq. 4.18, which has two explanatory variables: lagged nondiscretionary income and lagged discretionary accruals. The model is significant at 1% (prob>chi-square = 0.0000). The explanatory power of the model is slightly higher than the model which includes nondiscretionary income as the sole explanatory variable, which leads to the conclusion that discretionary accruals have little incremental explanatory power over nondiscretionary income assuming that the modified Jones model (1995) measures discretionary accruals accurately.

Table 5.20

Panel Data Analysis Results of Model L6

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.ndi	0.9930907
	(3.55)***
l.dacc	0.1817322
	(0.72)
constant	0.2099174
	(4.56)***
Number of observations	805
Number of groups	115
Wald chi^2	19.85
Prob>chi^2	0.0000
Goodness of Fit (R^2)	0.0241
legend	**p<0.10; **p<0.05; ***p<0.01*

Table 5.21 below presents the results for the last multivariate regression model, Model L7 as defined by Eq. 4.19, which has three explanatory variables: lagged cash flows from operations, lagged nondiscretionary income and lagged discretionary accruals. The model is significant at 1% level (prob>chi-square = 0.0001). This model has the highest explanatory power among the lagged models as measured by its R-squared (2.59%).

Table 5.21

Panel Data Analysis Results of Model L7

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.cfo	-2.113021
	(-1.19)
l.ndi	3.076194
	(1.74)*
l.dacc	0.1938298
	(0.76)
constant	0.1647547
	(2.77)***
Number of observations	805
Number of groups	115
Wald chi^2	21.28
Prob>chi^2	0.0001
Goodness of Fit (R^2)	0.0259
legend	**p<0.10; **p<0.05; ***p<0.01*

Table 5.22 below summarizes the results of the regression estimates of stock returns vs. lagged earnings and components of earnings (the time lag is one year).

Table 5.22

Summary Results of Regressions of Stock Returns on Lagged Earnings and Components of Earnings

	Intercept	l.cfo	l.ndi	l.ni	l.acc	l.ndacc	l.dacc	R^2
Model L1	0.2290045 (5.67)***	1.037686 (4.19)***						2.14%
Model L2	0.1996137 (4.57)***		1.087018 (4.40)***					2.35%
Model L3	0.2924515 (7.69)***			0.5328522 (1.74)*				0.38%
Model L4	0.2346245 (5.76)***	0.9026903 (3.24)***			0.26493 (1.06)			2.27%
Model L5	0.1549435 (2.66)***	1.063962 (4.29)***				3.122674 (1.77)*		2.52%
Model L6	0.2099174 (4.56)***		0.9930907 (3.55)***				0.1817322 (0.72)	2.41%
Model L7	0.1647547 (2.77)***	-2.113021 (-1.19)	3.076194 (1.74)*				0.1938298 (0.76)	2.59%

*Legend: *p<0.10; **p<0.05; ***p<0.01*

5.2.4 Robustness of the Analysis and Limitations

The random effects GLS regression estimations for contemporaneous stock returns vs. earnings and components of earnings as well as stock returns vs. lagged earnings are run with the robust option in Stata to test the robustness of the models to problems such as lack of normality, heteroscedasticity or heterogeneity by estimating robust standard errors. With the robust option, the estimates of coefficients remain the same as in the GLS estimations, only the test statistics and the standard errors are different from the original models. The results of the estimations with the robust option indicate that Model C1, Model C2, Model C4, Model C6 are not significant at 5% level (Wald chi-square values of 1.63, 1.24 and 2.08, respectively). Model C3 is robust at 5% level and Model C7 is significant at 10% level (Wald chi-square values of 5.07 and 6.46, respectively). This problem may be solved by the addition of more data into the

analysis, however, due to the fact that the capital market in Turkey is relatively small there are a limited number of firms that meet the criteria to be involved in this empirical analysis.

On the other hand, the results of the estimations with the robust option indicate that the lagged models are significant under the robust option. Model L1, L2, L4, L5, L6 and L7 are significant at 1% level, while Model L3 is significant at 5% level. This implies that the lagged earnings and components of earnings are better at explaining the stock returns. The results of the robust models for the lagged analysis are presented in the Appendix to this thesis.

The analysis is based on the comparison of the R-squared values and the coefficients on independent variables however, it can be further developed by performing a likelihood test that provides statistical results on which model explains the dependent variable better.

Moreover, the tests are not performed by controlling for the industry classifications. This is again due to the fact that the number of firms listed on the stock exchange are not sufficient since the industry classes that include less than 10 firms would be excluded from the study, which would lead to a loss of significant number of data.

6 CONCLUSION

This section of the thesis reviews the study and the results of the empirical research in this thesis briefly together with any potential shortcomings and suggestions for further research. The main aim of this thesis is to study the effect of a specific portion of accounting information on the stock prices, and therefore stock returns, of publicly listed companies. The accounting information that is considered as having one of the most substantial effects on stock prices is the earnings information as explained in the prior sections. Therefore, measuring the effect of this specific information item on stock returns should shed a light on market quality, which is currently measured as the immediate reflection of new information on stock prices under the efficient market hypothesis. This quality of the markets, has an effect on capital allocation decisions. Since the end of year financial reports are a key source of information, they are expected to play a central role in the informational efficiency of a capital market.

The use of accrual based accounting systems brings about the fact that earnings information reported by companies have certain components that have different characteristics. Because of the fact that some income and expense items are recorded before they are actually collected or paid in cash; a portion of the earnings is composed of cash flows and the remaining portion consists of accruals. Current literature includes research that opt for the usefulness of cash flow information. However, there are yet a significant number of studies that cite that accrual information is also valuable since it provides information that signal the management insight. In addition to this distinction between the components of earnings information, the accruals component also includes subcomponents that are different in their natures. Some of the accruals are recorded automatically as a result of the normal operations, such as the accrual of an on-account sales; however, some of the accruals depend on the judgement of managers, such as the provisions for legal cases. Since, the TFRS, the financial reporting standards adopted by the publicly listed companies in Turkey, are based on a principle based standards set (the IFRS) they provide room for the use of managerial discretion. Therefore, the accrual component of earnings can be further separated into its nondiscretionary and discretionary components. Examining the individual effects of these different components and subcomponents on stock returns, would provide information on the usefulness of accounting

information provided especially to external decision makers, who are the current and potential investors of the companies.

In order to test the usefulness of earnings information, the empirical study in this thesis examines the explanatory power of earnings and components of earnings on stock returns for an eight-year period from 2008 to 2015 for the manufacturing companies that are listed in Borsa Istanbul, which is the main securities exchange that govern all of the exchange activities that are operated in the Turkish capital markets. The capital market activity is governed by the Turkish Capital Markets Board and the period starts from the date that the companies are required to present their financial statements according to the TFRS, which are direct translations of the IFRS, as required by the Turkish Capital Markets Board. The earnings information presented in the financial statements of the companies is disaggregated to its cash flows, discretionary accruals and nondiscretionary accruals components to investigate the informativeness of different components of earnings, separately. The discretionary accruals component is measured using the modified Jones model by Dechow (1995). The empirical tests are conducted in two groups. The first group of tests include the earnings information and the stock returns contemporaneously; whereas the second group includes lagged earnings information and current stock returns, where the time lag is one year.

Both of the groups include seven models which aim to measure the explanatory power of earnings and its components. The explanatory power of the items is measured as the r-squared values of the regression models and the coefficients of the explanatory variables. The first three models of each group are univariate regression models that include only one earnings component as the explanatory variable. The remaining four models in each group are multivariate regression models that include multiple earnings components as the explanatory variables. The results of the empirical tests on contemporaneous stock returns and earnings components indicate that the model that includes cash flows from operations, nondiscretionary income and discretionary accruals as the explanatory variables (Model C7) has the highest explanatory power among the contemporaneous models as measured by its R-squared (1.26%). An examination of Model C1 and Model C2, which include cash flows from operations and nondiscretionary income as the explanatory variables, respectively, indicate that cash flows from operations are more value relevant than nondiscretionary accrual information. Model C3

includes net income as the explanatory variable and the results of the three univariate regressions indicate that net income is the most value relevant explanatory variable and market attaches value to discretionary accruals.

When total accruals are added in Model C4 as an explanatory variable to the regression which includes cash flows as the sole explanatory variable (Model C1) the R-squared of the model increases. However, the coefficient of cash flows from operations is higher than the coefficient of total accruals. Also, the sign of the coefficient of total accruals is not as predicted. Although the R-squared of Model C5 is higher than that of Model C1 the coefficient of nondiscretionary accruals is negative, which is consistent with the findings in Model C1 and Model C2. Model C6 implies that discretionary accruals do not have incremental explanatory power over nondiscretionary income. Model C7 shows that it has the highest explanatory power with cash flows having the highest coefficient power with its predicted sign. The results indicate that when examined separately the accruals information do not have incremental information content; however, net income in total has more information content over cash flow information. Therefore, it can be concluded that, on the contemporaneous level, the earnings component that has the highest explanatory power is cash flows from operations.

Generally, the explanatory powers of the lagged models are remarkably higher than the explanatory powers of the contemporaneous models. The explanatory power of the model that includes lagged nondiscretionary income as the explanatory variable (Model L2) is slightly higher than the model that includes lagged cash flows from operations as the explanatory variable (Model L1); however, the explanatory power significantly decreases when lagged net income is employed as the sole explanatory variable. This implies market attaches the highest value to cash flow information in a lagged manner. When lagged accruals are included as an independent variable the explanatory power of the model is slightly higher compared to including lagged cash flows as the sole explanatory variable. The model with lagged cash flows and lagged nondiscretionary accruals (Model L5) have a higher explanatory power when compared to Model L1 and Model L4, which implies that market considers discretionary accrual information as introducing noise in a lagged manner. That is also consistent with the results of Model L6, which includes lagged nondiscretionary income and lagged discretionary accruals as the explanatory variables, because the explanatory power decreases moving from

Model L5 to Model L6. The model that has the highest explanatory power is Model L7, which includes cash flows from operations, nondiscretionary income and discretionary accruals on a lagged basis.

The results of the lagged models are robust at 1% for Model L1, L2, L4, L5, L6 and L7 and 5% for Model L3; whereas only two models are robust in the contemporaneous group (Model C3 at 5% and Model C7 at 10%). Moreover, there is an issue of multicollinearity between cash flows from operations and nondiscretionary income. This problem may be solved by addition of new data to the models, which can be realized through the release of new annual financial information by the companies. The results of the models that include discretionary accruals as an explanatory variable are valid under the assumption that the cross-sectional variation of the modified Jones Model by Dechow (1995) accurately measures the discretionary accruals.

This thesis contributes to the existing literature by investigating a vivid research question in the setting of a developing market. One of the main distinctions of the thesis is in the measurement of accruals, which is an important variable. By adjusting the net income for the net other income or loss and measuring accruals as the difference between this adjusted figure and cash flows from operations accruals related to the working capital items are measured in a more precise way.

The implication of the empirical evidence from the analysis in this thesis suggests that lagged earnings information has more explanatory power on stock returns than the contemporaneous earnings information as implied by the higher R-squared values in the regression models that employ lagged earnings information as the independent variable(s). This finding is consistent with the existing literature that posit the decline in the contemporaneous linear relation between annual stock returns and earnings.

The findings in this research has implications for investors and policy makers. The first implication for the investors is that the results imply that new information is not immediately reflected into the stock prices as suggested by the efficient market hypothesis as evidenced by the higher explanatory powers of the lagged models. The results are in line with the literature that most of the decisions are based on cash flow information. Thus, one of the

implications for the policy makers would be to increase the investor awareness into the usefulness of financial information that is considered as quality and another one would be to improve the value relevance of financial information through overcoming the shortcomings and pitfalls in the current system. For the context of Turkey, the loss of value relevance in contemporaneous earnings information opens up areas for further research where the reasons behind this finding can be investigated.

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APPENDIX I

Robust Test Results of the Lagged Stock Returns-Earnings Association

Panel Data Analysis Results of Model L1 under the Robust Option

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.cfo	1.037686
	(3.71)***
constant	0.2290045
	(7.09)***
Number of observations	805
Number of groups	115
Wald chi^2	13.74
Prob>chi^2	0.0002
Goodness of Fit (R^2)	0.0214
legend	**p<0.10; **p<0.05; ***p<0.01*

Panel Data Analysis Results of Model L2 under the Robust Option

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.ndi	1.087018
	(3.91)***
constant	0.1996137
	(5.76)***
Number of observations	805
Number of groups	115
Wald chi^2	15.33
Prob>chi^2	0.0001
Goodness of Fit (R^2)	0.0235
legend	**p<0.10; **p<0.05; ***p<0.01*

Panel Data Analysis Results of Model L3 under the Robust Option

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.ni	0.5328522
	(2.01)**
constant	0.2924515
	(8.58)***
Number of observations	805
Number of groups	115
Wald chi^2	4.05
Prob>chi^2	0.0442
Goodness of Fit (R^2)	0.0038
legend	**p<0.10; **p<0.05; ***p<0.01*

Panel Data Analysis Results of Model L4 under the Robust Option

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.cfo	0.9026903
	(3.02)***
l.acc	0.26493
	(1.50)
constant	0.2346245
	(7.04)***
Number of observations	805
Number of groups	115
Wald chi^2	18.67
Prob>chi^2	0.0001
Goodness of Fit (R^2)	0.0227
legend	**p<0.10; **p<0.05; ***p<0.01*

Panel Data Analysis Results of Model L5 under the Robust Option

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.cfo	1.063962
	(3.79)***
l.ndacc	3.122674
	(1.87)*
constant	0.1549435
	(3.97)***
Number of observations	805
Number of groups	115
Wald chi^2	18.65
Prob>chi^2	0.0001
Goodness of Fit (R^2)	0.0252
legend	**p<0.10; **p<0.05; ***p<0.01*

Panel Data Analysis Results of Model L6 under the Robust Option

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.ndi	0.9930907
	(3.35)***
l.dacc	0.1817322
	(1.13)
constant	0.2099174
	(5.60)***
Number of observations	805
Number of groups	115
Wald chi^2	18.77
Prob>chi^2	0.0001
Goodness of Fit (R^2)	0.0241
legend	**p<0.10; **p<0.05; ***p<0.01*

Panel Data Analysis Results of Model L7 under the Robust Option

Dependent Variable : ret	
Explanatory Variable(s)	**Estimated Coefficients (z-value)**
l.cfo	-2.113021
	(-1.22)
l.ndi	3.076194
	(1.82)*
l.dacc	0.1938298
	(1.19)
constant	0.1647547
	(4.06)***
Number of observations	805
Number of groups	115
Wald chi^2	21.19
Prob>chi^2	0.0001
Goodness of Fit (R^2)	0.0259
legend	**p<0.10; **p<0.05; ***p<0.01*

APPENDIX II

List of Companies Included in the Empirical Analyses

No.	Ticker Symbol	Name of the Company	Sector
1	ADANA:IS	Adana Çimento Sanayii T.A.Ş.	BIST Non-Metal Mineral Product
2	ADBGR:IS	Adana Çimento Sanayii T.A.Ş.	BIST Non-Metal Mineral Product
3	ADEL:IS	Adel Kalemcilik Ticaret ve Sanayi A.Ş.	BIST Industrials
4	ADNAC:IS	Adana Çimento Sanayii T.A.Ş.	BIST Non-Metal Mineral Product
5	AEFES:IS	Anadolu Efes Biracilik ve Malt Sanayii A.Ş.	BIST Food and Beverage
6	AFYON:IS	Afyon Çimento Sanayi T.A.Ş.	BIST Non-Metal Mineral Product
7	AKCNS:IS	Akçansa Çimento Sanayi Ve Ticaret A.Ş.	BIST Non-Metal Mineral Product
8	AKSA:IS	Aksa Akrilik Kimya Sanayii A.Ş.	BIST Chemicals, Petrol and Plastic
9	ALCAR:IS	Alarko Carrier Sanayi Ve Ticaret A.Ş.	BIST Metal Products and Machinery
10	ALKA:IS	Alkim Kağit Sanayi Ve Ticaret A.Ş.	BIST Wood, Paper and Printing

No.	Ticker Symbol	Name of the Company	Sector
11	ALKIM:IS	Alkim Alkali Kimya A.Ş.	BIST Chemicals, Petrol and Plastic
12	ANACM:IS	Anadolu Cam Sanayii A.Ş.	BIST Non-Metal Mineral Product
13	ARCLK:IS	Arçelik A.Ş.	BIST Metal Products and Machinery
14	ARSAN:IS	Arsan Tekstil Ticaret Ve Sanayi A.Ş.	BIST Textile and Leather
15	ASLAN:IS	Aslan Çimento A.Ş.	BIST Non-Metal Mineral Product
16	ASUZU:IS	Anadolu Isuzu Otomotiv Sanayi Ve Ticaret A.Ş.	BIST Metal Products and Machinery
17	ATEKS:IS	Akin Tekstil A.Ş.	BIST Textile and Leather
18	AYGAZ:IS	Aygaz A.Ş.	BIST Chemicals, Petrol and Plastic
19	BAGFS:IS	Bagfaş Bandirma Gübre Fabrikalari A.Ş.	BIST Chemicals, Petrol and Plastic
20	BAKAB:IS	Bak Ambalaj Sanayi Ve Ticaret A.Ş.	BIST Wood, Paper and Printing
21	BANVT:IS	Banvit Bandirma Vitaminli Yem Sanayii A.Ş.	BIST Food and Beverage

No.	Ticker Symbol	Name of the Company	Sector
22	BFREN:IS	Bosch Fren Sistemleri Sanayi Ve Ticaret A.Ş.	BIST Metal Products and Machinery
23	BOLUC:IS	Bolu Çimento Sanayii A.Ş.	BIST Non-Metal Mineral Product
24	BOSSA:IS	Bossa Ticaret Ve Sanayi İşletmeleri T.A.Ş.	BIST Textile and Leather
25	BRISA:IS	Brisa Bridgestone Sabanci Lastik Sanayi Ve Ticaret A.Ş.	BIST Chemicals, Petrol and Plastic
26	BRSAN:IS	Borusan Mannesmann Boru Sanayi Ve Ticaret A.Ş.	BIST Basic Metal
27	BSOKE:IS	Batisöke Söke Çimento Sanayii T.A.Ş.	BIST Non-Metal Mineral Product
28	BTCIM:IS	Batiçim Bati Anadolu Çimento Sanayii A.Ş.	BIST Non-Metal Mineral Product
29	BUCIM:IS	Bursa Çimento Fabrikasi A.Ş.	BIST Non-Metal Mineral Product
30	BURCE:IS	Burçelik Bursa Çelik Döküm Sanayii A.Ş.	BIST Basic Metal
31	CCOLA:IS	Coca-Cola İçecek A.Ş.	BIST Food and Beverage
32	CEMTS:IS	Çemtaş Çelik Makina Sanayi Ve Ticaret A.Ş.	BIST Basic Metal

No.	Ticker Symbol	Name of the Company	Sector
33	CIMSA:IS	Çimsa Çimento Sanayi Ve Ticaret A.Ş.	BIST Non-Metal Mineral Product
34	CMBTN:IS	Çimbeton Hazirbeton Ve Prefabrik Yapi Elemanlari Sanayi Ve Ticaret A.Ş.	BIST Non-Metal Mineral Product
35	CMENT:IS	Çimentaş İzmir Çimento Fabrikasi T.A.Ş.	BIST Non-Metal Mineral Product
36	COMDO:IS	Componenta Dökümcülük Ticaret Ve Sanayi A.Ş.	BIST Basic Metal
37	DENCM:IS	Denizli Cam Sanayii Ve Ticaret A.Ş.	BIST Non-Metal Mineral Product
38	DERIM:IS	Derimod Konfeksiyon Ayakkabi Deri Sanayi Ve Ticaret A.Ş.	BIST Textile and Leather
39	DEVA:IS	Deva Holding A.Ş.	BIST Chemicals, Petrol and Plastic
40	DGKLB:IS	Doğtaş Kelebek Mobilya Sanayi Ve Ticaret A.Ş.	BIST Wood, Paper and Printing
41	DGZTE:IS	Doğan Gazetecilik A.Ş.	BIST Wood, Paper and Printing
42	DITAS:IS	Ditaş Doğan Yedek Parça İmalat Ve Teknik A.Ş.	BIST Metal Products and Machinery
43	DMSAS:IS	Demisaş Döküm Emaye Mamülleri Sanayii A.Ş.	BIST Basic Metal

No.	Ticker Symbol	Name of the Company	Sector
44	DOGUB:IS	Doğusan Boru Sanayii Ve Ticaret A.Ş.	BIST Non-Metal Mineral Product
45	DURDO:IS	Duran Doğan Basim Ve Ambalaj Sanayi A.Ş.	BIST Wood, Paper and Printing
46	DYOBY:IS	Dyo Boya Fabrikalari Sanayi Ve Ticaret A.Ş.	BIST Chemicals, Petrol and Plastic
47	EGEEN:IS	Ege Endüstri Ve Ticaret A.Ş.	BIST Metal Products and Machinery
48	EGGUB:IS	Ege Gübre Sanayii A.Ş.	BIST Chemicals, Petrol and Plastic
49	EGSER:IS	Ege Seramik Sanayi Ve Ticaret A.Ş.	BIST Non-Metal Mineral Product
50	EMKEL:IS	Emek Elektrik Endüstrisi A.Ş.	BIST Metal Products and Machinery
51	ERBOS:IS	Erbosan Erciyas Boru Sanayii Ve Ticaret A.Ş.	BIST Basic Metal
52	EREGL:IS	Ereğli Demir Ve Çelik Fabrikalari T.A.Ş.	BIST Basic Metal
53	ERSU:IS	Ersu Meyve Ve Gida Sanayi A.Ş.	BIST Food and Beverage
54	FMIZP:IS	Federal-Mogul İzmit Piston Ve Pim Üretim Tesisleri A.Ş.	BIST Metal Products and Machinery

No.	Ticker Symbol	Name of the Company	Sector
55	FROTO:IS	Ford Otomotiv Sanayi A.Ş.	BIST Metal Products and Machinery
56	GENTS:IS	Gentaş Genel Metal Sanayi Ve Ticaret A.Ş.	BIST Wood, Paper and Printing
57	GEREL:IS	Gersan Elektrik Ticaret Ve Sanayi A.Ş.	BIST Metal Products and Machinery
58	GOLTS:IS	Göltaş Göller Bölgesi Çimento Sanayi Ve Ticaret A.Ş.	BIST Non-Metal Mineral Product
59	GOODY:IS	Goodyear Lastikleri T.A.Ş.	BIST Chemicals, Petrol and Plastic
60	GUBRF:IS	Gübre Fabrikalari T.A.Ş.	BIST Chemicals, Petrol and Plastic
61	HEKTS:IS	Hektaş Ticaret T.A.Ş.	BIST Chemicals, Petrol and Plastic
62	HURGZ:IS	Hürriyet Gazetecilik Ve Matbaacilik A.Ş.	BIST Wood, Paper and Printing
63	IHEVA:IS	İhlas Ev Aletleri İmalat Sanayi Ve Ticaret A.Ş.	BIST Metal Products and Machinery
64	IZMDC:IS	İzmir Demir Çelik Sanayi A.Ş.	BIST Basic Metal
65	IZOCM:IS	İzocam Ticaret Ve Sanayi A.Ş.	BIST Non-Metal Mineral Product

No.	Ticker Symbol	Name of the Company	Sector
66	KARSN:IS	Karsan Otomotiv Sanayii Ve Ticaret A.Ş.	BIST Metal Products and Machinery
67	KARTN:IS	Kartonsan Karton Sanayi Ve Ticaret A.Ş.	BIST Wood, Paper and Printing
68	KENT:IS	Kent Gida Maddeleri Sanayii Ve Ticaret A.Ş.	BIST Food and Beverage
69	KERVT:IS	Kerevitaş Gida Sanayi Ve Ticaret A.Ş.	BIST Food and Beverage
70	KLMSN:IS	Klimasan Klima Sanayi Ve Ticaret A.Ş.	BIST Metal Products and Machinery
71	KNFRT:IS	Konfrut Gida Sanayi Ve Ticaret A.Ş.	BIST Food and Beverage
72	KONYA:IS	Konya Çimento Sanayii A.Ş.	BIST Non-Metal Mineral Product
73	KORDS:IS	Kordsa Teknik Tekstil A.Ş.	BIST Textile and Leather
74	KRDMA:IS	Kardemir Karabük Demir Çelik Sanayi Ve Ticaret A.Ş.	BIST Basic Metal
75	KRDMB:IS	Kardemir Karabük Demir Çelik Sanayi Ve Ticaret A.Ş.	BIST Basic Metal
76	KRDMD:IS	Kardemir Karabük Demir Çelik Sanayi Ve Ticaret A.Ş.	BIST Basic Metal

No.	Ticker Symbol	Name of the Company	Sector
77	KRSTL:IS	Kristal Kola Ve Meşrubat Sanayi Ticaret A.Ş.	BIST Food and Beverage
78	KUTPO:IS	Kütahya Porselen Sanayi A.Ş.	BIST Non-Metal Mineral Product
79	MAKTK:IS	Makina Takim Endüstrisi A.Ş.	BIST Metal Products and Machinery
80	MERKO:IS	Merko Gida Sanayi Ve Ticaret A.Ş.	BIST Food and Beverage
81	MNDRS:IS	Menderes Tekstil Sanayi Ve Ticaret A.Ş.	BIST Textile and Leather
82	MRDIN:IS	Mardin Çimento Sanayii Ve Ticaret A.Ş.	BIST Non-Metal Mineral Product
83	MRSHL:IS	Marshall Boya Ve Vernik Sanayii A.Ş.	BIST Chemicals, Petrol and Plastic
84	NUHCM:IS	Nuh Çimento Sanayi A.Ş.	BIST Non-Metal Mineral Product
85	OLMIP:IS	Olmuksan International Paper Ambalaj Sanayi Ve Ticaret A.Ş.	BIST Wood, Paper and Printing
86	OTKAR:IS	Otokar Otomotiv Ve Savunma Sanayi A.Ş.	BIST Metal Products and Machinery
87	PARSN:IS	Parsan Makina Parçalari Sanayii A.Ş.	BIST Metal Products and Machinery

No.	Ticker Symbol	Name of the Company	Sector
88	PENGD:IS	Penguen Gida Sanayi A.Ş.	BIST Food and Beverage
89	PETKM:IS	Petkim Petrokimya Holding A.Ş.	BIST Chemicals, Petrol and Plastic
90	PETUN:IS	Pinar Entegre Et Ve Un Sanayii A.Ş.	BIST Food and Beverage
91	PINSU:IS	Pinar Su Sanayi Ve Ticaret A.Ş.	BIST Food and Beverage
92	PNSUT:IS	Pinar Süt Mamulleri Sanayii A.Ş.	BIST Food and Beverage
93	PRKAB:IS	Türk Prysmian Kablo Ve Sistemleri A.Ş.	BIST Metal Products and Machinery
94	PRKME:IS	Park Elektrik Üretim Madencilik Sanayi Ve Ticaret A.Ş.	BIST Mining
95	SARKY:IS	Sarkuysan Elektrolitik Bakir Sanayi Ve Ticaret A.Ş.	BIST Basic Metal
96	SASA:IS	Sasa Polyester Sanayi A.Ş.	BIST Chemicals, Petrol and Plastic
97	SILVR:IS	Silverline Endüstri Ve Ticaret A.Ş.	BIST Metal Products and Machinery
98	SKTAS:IS	Söktaş Tekstil Sanayi Ve Ticaret A.Ş.	BIST Textile and Leather

No.	Ticker Symbol	Name of the Company	Sector
99	SODA:IS	Soda Sanayii A.Ş.	BIST Chemicals, Petrol and Plastic
100	TATGD:IS	Tat Gida Sanayi A.Ş.	BIST Food and Beverage
101	TBORG:IS	Türk Tuborg Bira Ve Malt Sanayii A.Ş.	BIST Food and Beverage
102	TIRE:IS	Mondi Tire Kutsan Kağit Ve Ambalaj Sanayi A.Ş.	BIST Wood, Paper and Printing
103	TOASO:IS	Tofaş Türk Otomobil Fabrikasi A.Ş.	BIST Metal Products and Machinery
104	TRCAS:IS	Turcas Petrol A.Ş.	BIST Industrials
105	TRKCM:IS	Trakya Cam Sanayii A.Ş.	BIST Non-Metal Mineral Product
106	TTRAK:IS	Türk Traktör Ve Ziraat Makineleri A.Ş.	BIST Metal Products and Machinery
107	TUKAS:IS	Tukaş Gida Sanayi Ve Ticaret A.Ş.	BIST Food and Beverage
108	TUPRS:IS	Tüpraş-Türkiye Petrol Rafinerileri A.Ş.	BIST Chemicals, Petrol and Plastic
109	ULKER:IS	Ülker Bisküvi Sanayi A.Ş.	BIST Food and Beverage

No.	Ticker Symbol	Name of the Company	Sector
110	UNYEC:IS	Ünye Çimento Sanayi Ve Ticaret A.Ş.	BIST Non-Metal Mineral Product
111	USAK:IS	Uşak Seramik Sanayii A.Ş.	BIST Non-Metal Mineral Product
112	VESBE:IS	Vestel Beyaz Eşya Sanayi Ve Ticaret A.Ş.	BIST Metal Products and Machinery
113	VESTL:IS	Vestel Elektronik Sanayi Ve Ticaret A.Ş.	BIST Metal Products and Machinery
114	YATAS:IS	Yataş Yatak Ve Yorgan Sanayi Ve Ticaret A.Ş.	BIST Textile and Leather
115	YUNSA:IS	Yünsa Yünlü Sanayi Ve Ticaret A.Ş.	BIST Textile and Leather