

Accrual anomaly and accounting standards  
Evidence from the adoption of IFRS by publicly listed  
companies in Finland

Accounting  
Master's thesis  
Sami Niskanen  
2016

# ACCRUAL ANOMALY AND ACCOUNTING STANDARDS

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publicly listed companies in Finland

Master's Thesis  
Sami Niskanen  
Spring 2016  
Accounting

Approved in the Department of Accounting \_\_\_ / \_\_20\_\_\_ and awarded the grade




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<b>Title of thesis</b> Accrual anomaly and accounting standards – Evidence from the adoption of IFRS by publicly listed companies in Finland		
<b>Degree</b> Master's degree		
<b>Degree programme</b> Accounting		
<b>Thesis advisor(s)</b> Juha Kinnunen		
<b>Year of approval</b> 2016	<b>Number of pages</b> 71	<b>Language</b> English

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### Abstract

Accrual anomaly was introduced to the financial market and accounting research by Sloan (1996). The anomaly consists of two empirical regularities. (1) The current accrual component of earnings predicts future earnings less well than the current cash flow component, in other words, the “earnings persistency” of the accrual component is lower than that of the cash flow component. (2) Contrary to the efficient market hypothesis, stock prices fail to fully reflect this information contained in the current earnings components; financial markets treat the accrual component of earnings as more persistent and the cash flow component as less persistent than they truly are.

This thesis examines whether the accrual anomaly found mainly in the U.S. stock markets exists in Finland as well, and whether the adoption of IFRS has any positive or negative effects to this particular financial market anomaly. The empirical analysis employs an ordinary least squares regression analysis to discern any over- or underweighting of the earnings components by the financial markets. The sample consists of Finnish publicly listed companies included in the OMX Helsinki Index (HEX), spanning the years 1993-2013.

The preliminary results indicate accrual overweighting for the pre-IFRS sub-period, which vanishes by the introduction of IFRS. The introduction of IFRS to the Finnish institutional setting therefore increases the quality of financial statements, as evidenced by the elimination of accrual overweighting for the post-IFRS sub-period. The results after robustness testing however negate the preliminary results, as accrual overweighting vanishes for the pre-IFRS sub-period when running robust regressions. There is however disagreement among researchers on conducting robustness tests, and indeed most of the research on accrual anomaly does not conduct conventional robustness testing of the results. The interpretation of results and the conclusions to be drawn from them depend on the position taken towards robustness testing in accrual anomaly research. At the least it can be stated that the results of the empirical tests are contrary to establishing a positive connection between accrual anomaly and fair value accounting standards represented by IFRS.

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**Keywords** Accrual anomaly, market efficiency, earnings quality, IFRS, earnings management, abnormal returns, accrual accounting, accruals, cash flows

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**Tekijä** Sami Niskanen

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**Työn nimi** Accrual anomaly and accounting standards – Evidence from the adoption of IFRS by publicly listed companies in Finland

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**Tutkinto** Maisterin tutkinto

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**Koulutusohjelma** Laskentatoimi

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**Työn ohjaaja(t)** Juha Kinnunen

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**Hyväksymisvuosi** 2016**Sivumäärä** 71**Kieli** Englanti

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## Tiivistelmä

Sloan (1996) esitteli jaksotuseriin perustuvan anomalian rahoitusmarkkinoiden ja laskentatoimen tutkimukselle. Anomalia koostuu kahdesta empiirisestä säännönmukaisuudesta. (1) Nykyiset jaksotuserät ennustavat tulevaa tulosta heikommin kuin nykyiset kassavirrat, toisin sanoen, jaksotuserien ”tuloskestävyys” on heikompi kuin kassavirran. (2) Vastoin tehokkaiden markkinoiden hypoteesia, osakkeiden hinnat eivät täysin heijasta tätä informaatiota, joka sisältyy nykyisen tuloksen osatekijöihin; rahoitusmarkkinat ylipainottavat jaksotuseriä ja alipainottavat kassavirtaa suhteessa niiden todelliseen tuloskestävyyteen.

Tämä tutkimus selvittää esiintyykö tätä lähinnä Yhdysvaltain arvopaperimarkkinoilla havaittua jaksotuseriin perustuvaa anomaliaa myös Suomen arvopaperimarkkinoilla, ja onko IFRS-standardeihin siirtymisellä positiivisia tai negatiivisia vaikutuksia tälle anomalialle. Empiirinen analyysi soveltaa OLS-regressiomalleja tuloksen osatekijöiden mahdollisen yli- tai alipainottamisen selvittämiseksi. Otos koostuu suomessa julkisesti listatuista yhtiöistä, jotka kuuluvat OMX Helsinki indeksiin (HEX), vuosilta 1993-2013.

Alustavat tulokset indikoivat jaksotuserien ylipainottamista IFRS-standardieja edeltävällä ajanjaksolla. Jaksotuserien ylipainottaminen katoaa IFRS-standardien käyttöönoton myötä. Ylipainottamisen katoaminen IFRS-standardien käyttöönoton myötä todistaa sen puolesta, että IFRS-standardeihin siirtyminen parantaa tilinpäätöstietojen laatua Suomen institutionaalisessa ympäristössä. Alustavat tulokset menettävät kuitenkin tilastollisen merkittävyytensä robustisuus-testien myötä. Indikaatiot jaksotuserien ylipainottamisesta IFRS-standardieja edeltävällä ajanjaksolla katoavat sovellettaessa robustisia regressiomalleja. Tutkijoiden välillä ei kuitenkaan ole yhteisymmärrystä robustisuus-testien suorittamisen soveltuvuudesta, eikä suurin osa jaksotuserien anomaliaan liittyvästä tutkimuksesta suorita perinteisiä robustisuus-testejä. Tulosten tulkitseminen ja niistä vedettävät johtopäätökset riippuvat näkemyksestä robustisuus-testejä kohtaan. Vähintäänkin voidaan sanoa, että empiiristen testien tulokset eivät indikoi positiivista suhdetta jaksotuserien anomalian ja IFRS-standardien edustaman käyvän arvon periaatteen välillä.

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**Avainsanat** Accrual anomaly, markkinatehokkuus, tuloksen laatu, IFRS, tuloksen ohjaus, abnormaalit tuotot, suoriteperusteinen tuloslaskenta, jaksotuserät, kassavirrat

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# 1 Introduction

Let us begin by introducing the subject matter at hand, namely, the accrual anomaly. Richard Sloan introduced accrual anomaly to financial market and accounting research in his 1996 paper: *“Do Stock Prices Fully Reflect Information in Accruals and Cash Flows about Future Earnings?”* In this paper Sloan introduced the two empirical regularities constituting the accrual anomaly: (1) the empirical regularity of current earnings components having a differing ability to predict future earnings performance and (2) the empirical regularity of stock prices acting as if investors fail to reflect fully this information contained in the accrual and cash flow components of current earnings until that information impacts future earnings.

The extent to which current earnings components are able to predict future earnings is referred to as their earnings persistency. Sloan empirically demonstrates that the accrual component of current earnings is less persistent towards future earnings than the cash flow component. The empirical tests of market efficiency conducted by Sloan indicate that stock prices fail to identify the lower earnings persistency of the accrual component, treating the accrual component as more persistent than it truly is and the cash flow component as less persistent than it truly is. The existing literature on accrual anomaly refers to this as overweighting or underweighting, or alternatively as overpricing or underpricing, of the current earnings components. Sloan demonstrates that by exploiting the resulting predictable mispricing of securities by an appropriate trading strategy, anomalous returns may be generated.

Financial market anomalies and the prospects for anomalous returns have always fascinated the imaginations of many. More often than not, promises of spectacular gains have been found empty, and dreams turned into dust. The existence and the extent of financial market anomalies makes a great difference to anyone associated with financial markets, whether a professional practitioner, a small investor, or a member of the regulatory body. Market anomalies are not stable in their occurrence or magnitude. Strategies based on these anomalies are usually risky and difficult to exploit. However, anyone venturing into financial markets should be aware of these anomalies and take them into account in their decision making. Empirical research increases our knowledge of the anomalies occurring in the financial markets.

Empirical research on financial market anomalies is also a necessary basis for regulatory decisions. The more reliably an anomaly can be traced to its sources, the more accurately it may be discerned whether it is associated with the existing regulatory framework or accounting legislation, due to distorting effects or lack of proper regulation. The regulatory framework and accounting legislation are under the control of authorities and may be improved by the suggestions of empirical research. Empirical research on anomalies assists in deciding on appropriate regulatory actions and accounting legislation. Whether or not accrual anomaly is connected with a certain regulatory framework is a key theme of this thesis.

## **1.1 Background**

Every business enterprise faces a similar problem in measuring its performance: performance needs to be measured for a discrete time period, yet cash flows generated by the operations do not necessarily match this time period. This timing problem is solved by the use of accruals, which can be thought of as a proxy for the “misdated” cash flows. Accordingly, Dechow and Dichev (2002, 53) define accruals as “...*temporary adjustments that resolve timing problems in the underlying cash flows...*” Under accrual accounting earnings are therefore divided into two components, cash flows and accruals.

The usage of accruals in measuring performance introduces a certain trade-off in the revenue recognition process. Accruals always represent best estimations, and as such, are bound to include errors. Accrual erroneousousness lowers the earnings quality of the financial statements. Another factor lowering the earnings quality is earnings management, which commonly involves accrual manipulation. Unintentional misestimation and intentional manipulation of accruals introduces errors into the accruals process, which lower the earnings quality. The accrual component of current earnings tends to be less persistent towards future earnings, which is confirmed by the existing research on accruals. The cash flow component of earnings is less prone to errors or earnings management.

The efficient market hypothesis states that stock prices should more or less reflect all publicly available information. Stock prices should therefore also reflect the information on the differing earnings persistency of the earnings components. If financial markets are unable to discriminate appropriately between the earnings components, mispricing of securities is bound to occur, and the efficient market hypothesis is violated. Violations of the efficient market hypothesis are

termed market anomalies, and Sloan (1996) was the first to demonstrate an accrual based anomaly.

## **1.2 Research question**

This thesis investigates accrual anomaly in the Finnish institutional setting, focusing on the effects that the transition to International Financial Reporting Standards (IFRS) has on the occurrence and extent of accrual anomaly in this setting. The research question is twofold. The first research question concerns the occurrence of accrual anomaly in the Finnish context:

*(1) Does the accrual anomaly occur in the Finnish institutional setting?*

The second research question concerns the effects of the adoption of IFRS on accrual anomaly. The effects of a complete change in the implemented accounting standard - from Finnish Accounting Standards (FAS) to IFRS - is investigated under a single institutional setting. What makes this particular change in accounting standards interesting, with potentially significant results to the accrual anomaly, is the diverging regulatory philosophies of these two accounting standards. Finnish Accounting Standards have traditionally been designated for the informational uses of debtors and other interest groups, using historical cost accounting and urging reliability even at the cost of relevance (Pirinen 2005). International Financial Reporting Standards are in contrast to a greater degree intended to suit the informational needs of financiers and use fair value accounting to achieve greater relevance. The second research question is stated as follows:

*(2) Does the adoption of IFRS have any effects on the occurrence or extent of accrual anomaly in the Finnish institutional setting?*

## **1.3 Contribution to the research field**

Accrual anomaly has been extensively studied since Sloan introduced it to the financial market and accounting research. Different theories have been put forth in explaining the cause for the lower earnings persistency of the accrual component, and in explaining why financial markets fail to fully reflect this information. Accrual anomaly has also been explained away as subsumed by risk or as a result of model misspecification. Most of the research has been

conducted in the context of the U.S. stock markets. The few existing international studies find accrual anomaly to be a phenomenon mainly exclusive to common law institutional settings with their fair value accounting framework.

This naturally raises the question regarding the connection between accounting standards and accrual anomaly. Ideally, to entangle the effects that accounting standards have on the accrual anomaly, one would need to construct a *ceteris paribus* experiment where all other factors excluding the accounting standards stay constant. The closest approximation to this ideal experimental setting as is available to a researcher is to investigate a transition from one accounting standard to another in a single institutional setting. IFRS become mandatory in Finland from fiscal year 2005 forwards, offering just this opportunity to study the effects that a change in accounting standards has on accrual anomaly.

To the best knowledge of the author of this thesis, there exists only one published study investigating the effects of a change in accounting standards to the accrual anomaly. Kaserer and Klingler (2008) study the effects on accrual anomaly of the voluntary transition to international accounting standards (IFRS/US-GAAP) in Germany during the years 1995-2002. They present evidence that market overreaction to accrual information is a phenomenon primarily related to accounting information prepared under the fair valuation framework of international accounting standards. The introduction of fair value accounting framework therefore introduced accrual anomaly in the German institutional setting. Kaserer and Klingler present their results as contrary to conventional wisdom of fair value accounting offering higher quality financial statements.

Kaserer and Klingler qualify their results by presuming that the effects of adopting a particular accounting framework depend on the corporate governance system under which the accounting framework is implemented. Under weak corporate governance systems fair value accounting might result in more extensive accrual manipulation. As Kaserer and Klingler (2008, 3) state:

*“...switching from a conservative accounting system to a true and fair view system under a weak corporate governance system might have a negative impact on the quality of accounting information. However, due to a lack of empirical evidence, we do not know whether this might also have happened if this switch had occurred under a strong corporate*

*governance system. Hence, the impact of the corporate governance system as such must be left open to future research.”*

This thesis does its part to fill this gap in the research field on accrual anomaly. Based on existing comparative research, the corporate governance regime in Finland may be characterized as semi-strong. The thesis investigates the effects on accrual anomaly of a transition to fair value accounting framework under a semi-strong corporate governance regime. In addition to this main contribution, the thesis presents empirical results regarding the occurrence of accrual anomaly outside of the U.S. context, which is lacking in its current extent.

#### **1.4 Data and methods**

Empirical research conducted in this thesis employs both accounting data and market data on securities. Accounting data for the empirical research is gathered from the Thomson Reuters Worldscope database, whereas security returns and data on control variables are obtained from Thomson Financial Datastream database. The sample consists of the companies included in the OMX Helsinki Index (HEX), which is a market index including all of the publicly listed companies in the Finnish stock market. The returns on HEX are used as a benchmark for the calculation of abnormal returns. The sample covers the years 1993-2013. The final sample used in the empirical tests consists of 1277 firm years over the years 1993-2013, of which 618 fall between years 1993-2004 (pre-IFRS) and 659 between years 2005-2013 (post-IFRS).

The empirical analysis of the research questions proceeds as follows. First it is established whether the current earnings components exhibit differing earnings persistency, and whether the transition to IFRS has any effects on the earnings persistency properties of the earnings components. These are the tests on earnings persistency. Following this, empirical tests are conducted to investigate whether stock prices act as fully reflecting the earnings persistency information embedded in the current earnings components, and whether the transition to IFRS has any effects on this. These are the accrual anomaly tests.

The tests on earnings persistency are carried out by an ordinary least squares linear regression model where one-year-ahead earnings are regressed on current accruals and cash flows. The resulting coefficients for the current earnings components indicate their objective persistency towards future earnings. The potential effects that the transition to IFRS may have on earnings

persistence of the current earnings components are captured by introducing the transition as a dummy variable to the model.

For the accrual anomaly tests, a linear regression model is constructed where future abnormal returns are regressed on current earnings components. For the efficient market hypothesis to hold, future abnormal returns should not be dependent on current earnings components. The sign of the coefficients indicates the direction of the potential over- or underweighting. The transition to IFRS is captured by introducing the transition as a dummy variable to the model. The model is also estimated with control variables. Earnings-to-price ratio, book-to-market ratio and the logarithm of the market value have been shown to predict future returns. Their inclusion to the model mitigates the potential omitted variable bias that the model with only current earnings components may suffer from. Beta factor for each of the individual securities is included to control for the systematic risk differences. The regression model is also estimated with the inclusion of yearly dummies to control for the aggregate effect of yearly variation in abnormal returns caused by unobserved factors. In addition, robustness tests are conducted by winsorizing the variables at the 1<sup>st</sup> and 99<sup>th</sup> percentiles.

## **1.5 Results**

The results of the empirical tests on earnings persistence show that the cash flow component of current earnings is significantly more persistent than the accrual component, which is in accordance with previous empirical research on accruals and accrual anomaly. The transition to IFRS does not have significant effects on the differing earnings persistence of the current earnings components.

The empirical tests on accrual anomaly yield conflicting outcomes between preliminary results and robustness testing of the results. The preliminary results indicate overweighting of accruals by the financial markets. This overweighting is restricted to the pre-IFRS sub-period, and vanishes by the introduction of IFRS. The inclusion of the control variables to the model reduces the overweighting of accruals, but it nevertheless persists in the pre-IFRS sub-period. The inclusion of year dummies to the model does not significantly affect these results. However, robustness testing eliminates the statistical significance of accrual overweighting for the pre-IFRS sub-period indicated by the preliminary results.

The preliminary results indicate a negative connection between fair value accounting standards and accrual anomaly. The introduction of IFRS under a semi-strong corporate governance regime results in greater earnings quality as evidenced by the disappearance of accrual overweighting. However, the results after robustness testing do not indicate any connection between accounting standards and accrual anomaly. The introduction of IFRS under a semi-strong corporate governance regime does not result in accrual overweighting.

## **1.6 Limitations**

There are two kinds of limitations to the empirical research conducted in this thesis. The first limitation is peculiar to this thesis, which concerns the data used in the empirical analysis. The accounting data is collected from Thomson Reuters Worldscope database, which has gaps on the data on Finnish publicly listed companies. Missing data on key variables, especially on cash flow statements, from the beginning of the sample period to about 1998 curtails the sample. Handpicked data from various Finnish accounting databases might have yielded an expanded and perhaps a more accurate sample.

The other limitation is common to all financial market efficiency studies. This is the “joint hypothesis problem” (Jensen 1978, 96). Financial market efficiency is usually investigated by investigating whether abnormal returns are related to some publicly available information. Efficient markets should incorporate all publicly available information to security prices so that investors should not be able to consistently achieve returns in excess of average market return in risk-adjusted basis. Testing of market efficiency is therefore always dependent on the measure against which abnormal returns are compared, the measure constituting the “normality” of returns. This measure is impossible to establish objectively, and is bound to be controversial. There exists no absolute yardstick constituting the normality of returns for any individual security.

This being the inevitable context of financial market efficiency studies, the results may indicate that financial markets are inefficient, or either they may indicate that the underlying asset pricing model is flawed – or both. The conclusion between these alternatives cannot be drawn decisively. This is the “joint hypothesis problem”.

## **1.7 Structure of the thesis**

Following this introduction, chapter two introduces the theoretical background relevant to the subject matter of this thesis; accrual accounting, earnings management, earnings quality and the efficient market hypothesis are discussed as the background for the research on accrual anomaly. Chapter three is a literature review of previous research on accrual anomaly, where the main strands and conclusions of existing research are presented, and to some extent synthesized. Institutional setting is discussed in chapter four, along with formulating the exact hypotheses to be tested. Chapter five describes the data and variables employed in the empirical analysis. Empirical analysis is carried out in chapter six. The final chapter summarizes the thesis and presents conclusions on the results of the empirical analysis.

## **2 Theoretical background**

This chapter introduces the theoretical background relevant for the thesis. Accrual accounting, earnings management, earnings quality and the efficient market hypothesis are briefly discussed. Relevant theoretical background articulates as follows. Under accrual accounting earnings can be divided into two components: a cash flow component and an accrual component. Accruals work as a “proxy” for the relevant cash flows which realize outside of the particular performance measuring period. Accrual accounting is a process which requires estimation and as such is bound to contain errors due to future uncertainty. In addition to its inherent erroneousness, accrual accounting offers avenues for earnings management. Unintentional errors and intentional manipulation in the accrual component lower the quality of reported earnings. The cash flow component of earnings is more resilient to errors or manipulation. The earnings figure therefore includes two components with differing properties, which indicate differing earnings persistency between the components. Efficient market hypothesis states that financial markets should include this information in its pricing decisions of securities. To the extent they do not, this exhibits anomalous behavior by the financial markets.

### **2.1 Accrual accounting**

All commercial enterprises exist ultimately for the sake of generating positive cash flows. Measuring the performance could therefore be deduced to consist in calculating the cash flows realized over time. This would theoretically hold for a business over its lifetime, and would suffice if reporting would be done only once during its lifetime as the business is liquidated. However, a currently operating commercial enterprise is a going concern, having continuous reporting needs, as well as legal and contractual reporting requirements. A going concern needs to measure its performance for certain discrete periods in time, whether for quarterly or financial year end reporting. Measuring performance by realized cash flows would offer an inaccurate estimate of the performance for such a discrete period.

A going concern is constantly carrying out financial transactions. The cash flow effects of these financial transactions do not necessarily coincide with the dates of these transactions. As a discrete reporting time period, such as a financial year, is imposed on this continuous operating

activity, some cash flow effects of the financial transactions will fall outside of this imposed time period. Measuring performance by realized cash flows would therefore result in a distorted picture, as the realized cash flows alone would be unable to capture the whole economic significance of the financial transactions carried out in the time period.

Measuring the performance of an entity for a discrete period in time requires a way to resolve the timing problem of cash flows. This timing problem is resolved by the use of accruals (Dechow and Dichev 2002, 36). Dechow and Dichev (2002, 53) define accruals as follows: “...accruals are temporary adjustments that resolve timing problems in the underlying cash flows...” Accrual accounting is therefore held to be appropriate for financial reporting, instead of cash accounting (Penman and Yehuda 2009, 454). Accrual accounting anticipates probable future benefits and obligations (Allen, Larson and Sloan 2013, 115), and is accordingly found to provide a measure of short-term performance that more closely reflects expected cash flows than do realized cash flows (Dechow 1994, 35). Dechow (1994, 35) also finds that the ability of realized cash flows to measure firm performance improves relative to earnings as the measurement interval is lengthened, in accordance with the liquidation idea presented in the opening paragraph of this chapter.

In addition to this short-term smoothing role in earnings, Zhang (2007, 1336-1337) stresses the long-term smoothing role of accruals in earnings over firms’ business and life cycles. By recognizing the increase in production capacity and the buildup of inventories as positive accruals during the growth stage, accrual accounting smooths earnings over longer periods of expansion. Accrual accounting mitigates the noise in cash flows introduced by variations in working capital assets and liabilities between discrete periods of earnings measurement. This use of accruals could be said to “smooth” earnings over subsequent discrete periods in time. (Zhang 2007, 1336-1337.) Zhang (2007, 1336-1337) argues that the short-term smoothing role could easily be achieved by measuring earnings as a moving average of operating cash flows. Therefore, according to Zhang (2007, 1336-1337), accrual accounting incorporates a long-term investment perspective in addition to the short-term measurement perspective.

### **2.1.1 Accruals as part of financial statements**

Accrual accounting tracks the evolution of shareholders’ equity over discrete periods more accurately than cash accounting. Shareholders’ equity is updated by the earnings figure, the net

income for the discrete period. (Penman and Yehuda 2009, 456.) Net income calculated by accrual accounting consists of two components, operating cash flows and the temporary adjustments to resolve cash flow timing problems. These temporary adjustments are defined as accruals. By definition, then, net income can be divided into its components, operating cash flows and accruals:

$$\text{Net Income} = \text{Cash Flow from Operations} + \text{Accruals} \quad (1)$$

Accruals can be calculated as the difference between net income and operating cash flow. Accruals include depreciations and amortizations, write-downs, changes in working capital and appropriations. Changes in working capital include changes in inventories, accounts receivable and accounts payable. As temporary adjustments, accruals anticipate future economic benefits and liabilities. Growth in inventories and accounts receivable represent future economic benefits, as far as inventories are expected to be sold profitably and accounts receivable to be collected in their full amount. Growth in accounts payable and prepayments from customers represent future economic liabilities, as purchases need to be paid for and goods to be delivered. Recording these financial transactions as accruals mitigates the timing problem of the cash flows.

### **2.1.2 Accrual reversals**

Accruals are recorded in anticipation of future economic benefits and liabilities. As these benefits and liabilities are realized, the recorded accruals reverse. Dechow and Dichev (2002, 38) describe this process as follows: “*When recognition of a cash flow is shifted, two accrual entries are created, an opening and a closing accrual.*” Consider an entity that debits its accounts receivable at the end of the fiscal year, crediting its earnings by the same amount. The payment is then received in the following fiscal year, and the accrual is reversed by crediting accounts payable. The specific accrual item debited in the accounts receivable correctly anticipated future economic benefits, which were realized in the form of a cash inflow. The same entity may also buy services at the end of the fiscal year, to be paid in the following fiscal year. Accounts payable are credited, debiting earnings, and reversed in the following fiscal year as the payment is made for the services. This item recorded in the accounts payable correctly anticipated future economic liabilities, which were realized in the form of a cash outflow. Note that the cash flows from both of these financial transactions were realized only in the following

fiscal year. Pure cash flow accounting would then have “misplaced” these financial transactions in the subsequent reporting periods.

### **2.1.3 Erroneous accruals**

As anticipations of probable future economic benefits and liabilities, accruals are subject to inherent uncertainty. To the extent recorded accruals do not correctly anticipate future economic benefits and liabilities, errors in recorded accruals are revealed. These errors are revealed in the following fiscal years and must be corrected during the fiscal year they are revealed in, affecting the earnings figure for that fiscal year. (Dechow and Dichev 2002, 36; Allen et al. 2013, 115.) Dechow and Dichev (2002, 38) describe the reversal of erroneous accruals as follows:

*“When cash flows occur after the corresponding revenues and expenses are recognized in earnings, managers must estimate the amount of cash to be received or paid in the future. To the extent that cash flow realizations differ from their accrual estimates, the opening accrual will contain an estimation error that is corrected by the closing accrual...”*

All accruals must ultimately reverse. As correctly estimated accruals reverse, their anticipated effect on earnings has already been recorded in past earnings, and the reversal has no effect on current earnings. For instance, a payment for accounts receivable is made by a customer, resulting in debiting bank account and crediting accounts receivable by the amount. The anticipated cash flow, recorded as an accrual, equals the realized cash flow. The reversal of correctly anticipated accruals has effects only in the balance sheet.

On the contrary, as erroneous accruals reverse, their impact on past earnings reverses itself in current earnings. Since there is no cash flow to equal the past effect on earnings, the effect on past earnings must be reversed. This reversal on past earnings can only be done on current earnings. Thus the reversal of erroneous accruals has an impact on current earnings. Consider accounts receivable from an entity that goes bankrupt and is unable to pay its liabilities in full. These accruals have been recorded as earnings in anticipation of future cash flows, which then fail to realize. The past effect on earnings must be reversed in current earnings. A write-down has to be recorded on these lost earnings, instead of the anticipated cash flow. This write-down manifests itself on current earnings.

Allen et al. (2013, 115-116) specify accrual estimation error as consisting of ex ante biases and ex post shocks. Ex ante biases include misstatements and GAAP-induced distortions. Misstatements refer to accruals which do not correspond to a set of accepted accounting rules, such as overvaluing stale receivables. GAAP-induced distortions may include a regulatory demand to carry inventory at a lower cost than its market value. Ex post shocks are the accrual estimation errors. Accrual estimation error is the difference between the accrual and the subsequently realized benefit, which is due to misestimating the future economic benefits or liabilities of the accruals. Ex post shocks are frequently brought about by unanticipated general economic disturbances that may undo even the most accurate past estimations.

In measuring performance, accrual accounting is appropriate for financial reporting instead of cash accounting. The benefits of accrual accounting consist in mitigating the “noise” inherent in operating cash flows. However, this benefit comes at the cost of incurring estimation errors, which are inevitable when estimating future events. This is the trade-off inherent in accrual accounting. (Dechow and Dichev 2002, 54.) Dechow and Dichev (2002, 54) find that there is a positive correlation between levels of accruals and the magnitude of estimation errors, suggesting that this trade-off is inevitable.

## **2.2 Earnings management**

In the case of the bankrupt customer above, the errors in accruals arose due to misestimating the solvency of the customer. A certain amount of receivables were anticipated to be collected from the customer. However, a bankruptcy resulted in a total loss of these receivables. As long as there was no serious doubt about recovering the anticipated earnings, the resulting misestimation may be described as unintentional. Misstatements resulting from the breaching of accounting rules and principles may also be described as unintentional, as far as they are due to a mistake or ignorance. However, there is also a notable earnings management aspect to accruals. The usage of accruals offers an avenue for manipulating earnings by intentional misstatements and misestimations. Gunny (2010, 855) classifies earnings management into two categories: accruals management and real activities manipulation.

Accruals management does not change the underlying real operating activities, but instead involves certain accounting choices to manipulate reported financial statements. Accruals can

be generally divided to non-discretionary and discretionary accruals. Accruals management includes deliberate accounting decisions regarding discretionary accruals such as depreciations and depreciation plans, the valuation method of inventories, the valuation of accounts receivable and appropriations. By engaging in discretionary accruals management, management can intentionally or fraudulently misrepresent material events, transactions or other significant information in financial statements. (Gunny 2010, 855-856.) Earnings management has been shown to be strongly connected with accruals manipulation (Fields, Lys and Vincent 2001, 263-288). Badertscher (2011, 1492) further divides accruals management to within and outside the boundaries of generally accepted accounting principles. Rosner (2003, 367) quotes former U.S. Securities and Exchange Commission chairman referring to the line between legitimate and non-legitimate accruals management as “*a gray area between legitimacy and outright fraud*”.

Real activities manipulation involves decisions affecting the underlying real operating activities of the firm in order to manipulate current earnings figures (Gunny 2010, 855-856). Examples of these manipulation methods include acceleration of the timing of sales, lowering cost of goods sold through unnecessarily increased production, and decreases in discretionary expenses. Acceleration of the timing of sales to occur in current earnings can be achieved by price discounts and more lenient credit terms. Cost of goods sold can be lowered temporarily through increasing production as fixed overhead cost can be spread over a larger number of units. Decreases in discretionary expenses include advertising expenses, research and development as well as selling, general and administrative expenses. The first two of these real activities manipulation methods boost current earnings, although resulting in lower cash flows in the current period. Decreases in discretionary expenses on the other hand not only boost current earnings but may result in higher cash flows as well, at the risk of lower future earnings and cash flows. (Cohen, Dey and Lys 2008, 764-765.)

There are multiple sources of motivation for the management to misrepresent true economic performance. There are strong incentives to avoid the reporting of earnings decreases or negative earnings by earnings management (Burgstahler and Dichev 1996, 99-101). Earnings-based compensation systems may also prompt management to manipulate accruals (Cheng and Warfield 2005, 470-471; Bergstresser and Philippon 2006, 527-528). In addition to meeting earnings targets and avoiding reporting negative earnings, management may intentionally make biased accrual estimates in order stay within debt covenants (DeFond and Jiambalvo 1994, 174-

175). Other incentives for earnings management include maintaining customer and supplier confidence, along with securing better terms from the latter, as well as maintaining valuable employees. (Burgstahler and Dichev 1996, 122.)

Earnings are not managed only upwards. Income smoothing to reduce the volatility of earnings includes managing earnings upwards as well as downwards, to maintain steady or steadily growing earnings (Graham, Harvey and Rajgopal 2005, 66). Stock-based compensation schemes may also result in management avoiding large positive earnings surprises, to manage earnings downward, in order to reserve current earnings in case of future earnings disappointments. The value of stock-based compensation schemes is dependent on the future price of the stock option, therefore it might incentivize management to time the reporting of earnings accordingly. (Cheng and Warfield 2005 458-462, 470.). Also, in code-law countries it is generally considered imprudent to report income in excess of that required to justify dividends and bonuses, in order to minimize corporate tax. This also prompts for managing earnings downwards (Ball, Kothari and Robin 2000, 31-35; Kasanen, Kinnunen and Niskanen 1996, 287, 304-305).

### **2.3 Earnings quality**

The errors in the accrual component of earnings, due to unintentional estimation errors and intentional earnings management, are intimately related to earnings quality. Although earnings quality is not a precisely defined or agreed upon a concept, nevertheless there is some agreement on what might indicate relatively higher or lower earnings quality. From the perspective of the analyst, which is the relevant perspective for this thesis, Dechow and Schrand (2004, 5) define a high-quality earnings number as one that “...*accurately reflects the company’s current operating performance, is a good indicator of future operating performance, and is a useful summary measure for assessing firm value.*” High-quality earnings are also likely to be both persistent and predictable. However, persistency and predictability in earnings are not sufficient to indicate high-quality earnings, since these indicators can be achieved by earnings management. (Dechow and Schrand 2004, 5.)

Accrual accounting is held appropriate for financial reporting for its “smoothing effect” on earnings over subsequent discrete periods in time, as it reduces volatility in earnings. As such, it may be described as generating higher earnings quality figures than cash accounting.

However, the benefits of accrual accounting come at a cost, which is the inherent erroneousness in accruals. (Dechow and Dichev 2002, 54.) Earnings quality is improved when accruals mitigate the value-irrelevant noise in cash flows between discrete periods in time, but is reduced to the extent accruals are materially erroneous or are used to manipulate earnings figures. Erroneous accruals render earnings less accurate in reflecting current operating performance or indicating future operating performance, a less useful summary measure for assessing firm value, as well as reducing the persistency and predictability of earnings (Dechow and Schrand 2004, 12).

This trade-off in accrual accounting is exacerbated by the views about income that accounting standards reflect. Whether accounting standards view income as “an enhancement of wealth or command over economic resources”, or as “an indicator of the performance of an enterprise and its management”, this has effects on the reliability of the accrual process. The first view is consistent with a balance sheet approach, where the income statement represents changes in the fair values of assets and liabilities. To the extent accrual adjustments reflect transitory revaluations of assets and liabilities, earnings quality is likely to be lower. The second view is consistent with the revenue recognition principle and the matching principle, reflecting the context in which accrual accounting was introduced and discussed this far. Accrual adjustments carried out by these principles are less likely to be erroneous or subjective. Current accounting standards reflect both views to differing degrees. (Dechow and Schrand 2004, 10-12.)

Errors in accruals, whether unintentional or intentional, lower earnings quality. The lower the earnings quality, the more useful are cash flows in measuring earnings (Dechow and Schrand 2004, 10-12; Penman and Yehuda 2009, 459). Thus, there are tensions on whether accrual accounting or cash accounting provide higher quality earnings. This tension may be captured by the trade-off between relevance and reliability. Both are needed for high-quality earnings. Accrual accounting is at least theoretically more relevant, but its reliability is subject to aforementioned considerations. Cash flows may be short on relevance, but their reliability is much higher. (Dechow and Schrand 2004, 7-8.)

The two constituting components of the earnings figure, accruals and cash flows, exhibit differing properties. In short, plain earnings figures are not the whole story. The quality of the reported earnings figures needs to be considered as well. Earnings quality is thus a significant factor in security pricing, which should be correctly valued by the financial markets. To the

extent investors do not take into account the potentially differing earnings persistency of the accruals and cash flow components of earnings (neglecting to consider earnings quality appropriately) securities may become mispriced (Sloan 1996, 308; Collins and Hribar 2000, 104). This is the explanation introduced by Sloan (1996) to account for the accrual anomaly: investors are “fixed” on earnings figures without considering the quality of those figures carefully enough.

## **2.4 Efficient market hypothesis**

The background against which to detect an anomaly is the assumed efficiency of the financial markets. According to efficient market hypothesis, publicly available relevant information is already implicit in asset prices to such an extent that investors are not able to consistently achieve returns in excess of average market return in risk-adjusted basis (Malkiel 2003, 59). Market efficiency is presently a commonplace assumption among practitioners, researchers and the general public. Yet, it is a fairly recent notion. What follows is a brief discussion of the history of the efficient market hypothesis and a definition of the hypothesis in its current form, based on Dimson and Mussavian (1998).

The concept of market efficiency had been anticipated at the beginning of the century in a dissertation by Jean Bachelier, submitted to the Sorbonne University in 1900 for his PhD in mathematics. The results reached by Bachelier anticipated many of the analytical results rediscovered by finance academics in the second half of the century. In his dissertation, Bachelier concludes that commodity prices fluctuate randomly, modeling a stochastic process of fluctuations later to be called Brownian motion. (Dimson and Mussavian 1998, 91-92.) Brownian motion is the random motion of particles suspended in a fluid, resulting from their collisions with the quick atoms or molecules in the fluid; a stochastic process to which price fluctuations in the financial markets are compared to. The stochastic process of price fluctuations came also to be called the “random walk model” (Dimson and Mussavian 1998, 92).

Note that Bachelier found asset price fluctuations to be random, not asset prices themselves. Dimson and Mussavian (1998, 91-92) quote Bachelier’s dissertation as follows: “...*past, present and even discounted future events are reflected in market price, but often show no apparent relation to price changes*”. The random fluctuations of price changes, combined with

competitive pricing as evidenced by the documented difficulty of achieving abnormal returns, result in the efficient market hypothesis. Dimson and Mussavian (1998, 93-94) quote Paul Samuelson concluding that: “...*competitive prices must display price changes... that perform a random walk with no predictable bias.*” Efficient prices should not demonstrate any predictable movements. Predictability can only be based on some information, and all relevant information should already be implicit in the market price. Randomly wandering prices should make it impossible for a market analyst to predict the future path of security prices (Dimson and Mussavian 1998, 93). If the price fluctuations were not random, but predictable, this would indicate some inefficiency in price formation by the financial markets – an anomaly.

The evidence for the random fluctuations of asset prices and the difficulty of “beating the market” cumulated, culminating in a 1970 paper by Eugene F. Fama, “*Efficient Capital Markets: A Review of Theory and Empirical Work*”. In this paper Fama summarizes the early random walk literature and other studies on the information contained in the historical sequence of prices, along with his own contributions, as well as introducing currently familiar definitions for the three forms of market efficiency. (Dimson and Mussavian 1998, 94.) The three major forms of the efficient market hypothesis are "weak", "semi-strong", and "strong" efficiency. The weak-form of the hypothesis assumes that prices on traded assets reflect all past publicly available information, the semi-strong-form of the hypothesis assumes that in addition prices efficiently adjust to new publicly available information, and finally the strong-form of the hypothesis adds the assumption that prices instantly reflect even information not publicly available, such as “insider” information. (Fama 1970, 388.) Fama (1970, 416) concludes that “...*the evidence in support of the efficient markets model is extensive and...contradictory evidence is sparse.*”

However, the contradictory evidence soon emerged, as numerous discoveries of anomalous price behavior took place. Instead of unpredictable random fluctuations, certain series of price changes appeared to follow predictable paths. Ball and Brown (1968) discovered the tendency for a stock’s cumulative abnormal returns to drift in the direction of an earnings surprise following an earnings announcement. Basu (1977) documented the use of price-to-earnings ratios to forecast stock returns, followed by Banz (1981) on the anomalous long-run rate of return from investing in smaller companies. Fama and French (1992) indeed conclude that two variables, closely related to Basu's earnings and Banz's size variables capture much of the cross-sectional variation in stock returns over the period 1963-1990, implying that these variables are

able to predict much of the price fluctuations for this period. Other emerging anomalies included predictable price fluctuations related to stock market seasonalities, and the recurring negative long-run performance of new issues, documented by Ritter (1991) and Loughran and Ritter (1995). (Dimson and Mussavian 1998, 96-97.)

A central difficulty in interpreting results of studies on financial market anomalies should always be acknowledged. The existence or the extent of the anomaly is always dependent on the measure against which abnormal returns are compared to, the measure constituting the “normality” of returns. This measure is difficult to establish objectively, and is bound to be controversial. This being the inevitable context of financial market efficiency studies, the results may indicate that financial markets are indeed inefficient, or either they may indicate that the underlying asset pricing model is flawed – or both. The conclusion between these alternatives cannot be drawn decisively. This is the “joint hypothesis problem”, and it constitutes a limitation for this thesis as well. (Dimson and Mussavian 1998, 96-97, Jensen 1978, 96.)

### **3 Previous research**

A considerable amount of research has been done on accrual anomaly since its discovery. The following literature review introduces the main lines of research and approaches to the accrual anomaly. Basically, any explanation of accrual anomaly needs to address the following empirical regularities: the lack of earnings persistency of the accrual component of current earnings and the failure of stock prices to fully reflect this information embedded in the current earnings components. The distinct approaches to accrual anomaly fall roughly into three camps. The first approach, originating with Sloan (1996), takes the view that the lack of persistency in accruals is due to their inherent erroneousness, which the financial markets are unable to price correctly since they do not consider the earnings components separately. The second approach stresses the role of accruals as a component of growth in net operating assets, explaining the lack of persistency in accruals with growth-based causes, which the financial markets are unable to price correctly. This second approach links accrual anomaly to a more general anomaly concerning the mispricing of growth in long-term net operating assets. The third approach taken to accrual anomaly explains it away altogether as a reward for risk or as a result of incorrectly specified empirical models. These three approaches are discussed along with presenting the results of internationally conducted research on accrual anomaly and research into the continuing persistency of accrual anomaly. Finally, a summary and some conclusions on previous research are presented.

#### **3.1 Inherent erroneousness of accruals and “earnings fixation”**

Richard Sloan introduced accrual anomaly in his paper *“Do Stock Prices Fully Reflect Information in Accruals and Cash Flows about Future Earnings?”* (1996). Sloan investigates whether financial markets fail to distinguish between the differing earnings persistency of the earnings components. Sloan first establishes that earnings persistency of current earnings performance decreases in the magnitude of the accrual component of earnings and increases in the magnitude of the cash flow component of earnings (Sloan 1996, 290-291, 297-299). Following this, Sloan demonstrates that stock prices do not reflect appropriately these different earnings persistency properties of the accrual and cash flow components of earnings. Investors fail to fully anticipate the lower earnings persistency of the accrual component, treating the accrual component as more persistent in their valuations than it truly is. (Sloan 1996, 299-306.)

As investors misprice the earnings components, this implies predictable mispricing of securities, which could be exploited by an appropriate trading strategy. Sloan demonstrates that stable abnormal returns can be earned by a trading strategy long on low-accruals companies and short on high-accruals companies (Sloan 1996, 306-309). That is, a trading strategy long on underpriced securities and short on overpriced securities. The final prediction made by Sloan is that the abnormal returns are clustered around the subsequent year's earnings announcements, as the mispricing of the earnings components is revealed. Fulfilling the prediction, it is found that over 40 percent of the predictable returns of the constructed hedge portfolio are concentrated around the subsequent quarterly earnings announcement days, which is less than 5 percent of the total trading days. (Sloan 1996, 309-314.) Sloan introduced an "earnings fixation" hypothesis as an explanation for the occurrence of the accrual anomaly. According to this hypothesis investors are "fixated" on earnings figures, without considering the differing earnings persistency of its components, thus mispricing securities.

Collins and Hribar (2000) extend the research initiated by Sloan (1996) by investigating whether the accrual pricing anomaly holds for quarterly data as well, and whether the anomaly is distinct from another financial market anomaly, the post-earnings announcement drift. Accrual anomaly and the post-earnings announcement drift are both market mispricing anomalies which are manifested around earnings announcement days. In both anomalies, financial markets seem to misestimate future earnings in a predictable way. The implications of current earnings for future earnings are not fully incorporated in the security prices. This might be due to a failure to fully forecast the implications of current quarterly earnings surprises for future earnings, or a failure to distinguish between the differing earnings persistency of current earnings components - or both. (Collins and Hribar 2000, 102-105.)

Collins and Hribar (2000, 109-112) find that both post-earnings announcement drift and accrual mispricing occur on a quarterly basis. As regards the question of whether post-earnings announcement drift or accrual anomaly drive the mispricing of current earnings, Collins and Hribar (2000, 112-120) find that they are distinct anomalies as they can be combined to produce even greater abnormal earnings than either earns in isolation. A long position in firms with positive unexpected earnings and income decreasing accruals, combined with an offsetting short position in firms with negative unexpected earnings and income increasing accruals, yields considerable and stable abnormal returns. The financial markets seem to underemphasize

unexpected earnings surprises and overemphasize the earnings persistency of accruals, thus resulting in predictable over- and undervaluation of securities.

The implications for future earnings of both current earnings surprises and the earnings persistency of current accruals are mispriced. (Collins and Hribar 2000, 112-120.) Accrual mispricing does not explain post-earnings announcement drift, since they are positively correlated, reinforcing one another. If the mean reverting tendencies of negative accruals would capture the extent of post-earnings announcement drift, the latter anomaly could be explained by the former. Instead, the level of accruals embedded in an earnings surprise mitigates or exacerbates the amount of drift. A positive earnings surprise combined with large negative (positive) accruals exacerbates (mitigates) the post-earnings announcement drift. A negative earnings surprise combined with large negative (positive) accruals mitigates (exacerbates) the post-earnings announcement drift. (Collins and Hribar 2000, 120-121.) As regards the mispricing of accruals, Collins and Hribar (2000, 121) propose that investors do not account for the stronger mean-reverting tendencies of discretionary accruals, citing ongoing research at that time by Hong Xie.

The working paper by Xie cited by Collins and Hribar (2000) was published in 2001 under the title: *“The mispricing of Abnormal Accruals”*. The previous research by Sloan (1996) or Collins and Hribar (2000) did not investigate whether the overpricing of total accruals could be attributed to normal accruals (non-discretionary accruals) or abnormal accruals (discretionary accruals). Previous research had found abnormal accruals to be overpriced when they had arisen to increase earnings before initial public offerings or seasoned equity offerings, but the mispricing of abnormal accruals had not been studied in more general settings. (Xie 2001, 358.)

Xie (2001, 361-365) finds that abnormal accruals are the least persistent of the three earnings components investigated (cash from operations, normal accruals and abnormal accruals) and accordingly the lack of earnings persistency of total accruals is primarily attributed to abnormal accruals. The lack of earnings persistency and the mispricing of total accruals are found to be due primarily to abnormal accruals. (Xie 2001, 361-365.) Negative abnormal accruals result in undervaluation and positive abnormal accruals result in overvaluation. Xie (2001, 365) also conducts hedge-portfolio tests to confirm if abnormal returns can be earned by a trading strategy long on negative abnormal accruals and short on positive abnormal accruals. Hedge-portfolio

tests conducted by Xie (2001, 365-370) support the overpricing of abnormal accruals, but do not support the overpricing of normal accruals.

Xie (2001, 370-371) concludes that the lack of earnings persistency and the overpricing of total accruals reported by Sloan (1996) are due largely to abnormal accruals. Financial markets appear to be unable to correctly anticipate future earnings implications of current abnormal accruals, and thus predictably misprice securities.

The level of abnormal accruals is closely related to earnings quality. One aspect of earnings quality is earnings persistency, that is, how well current earnings predict future earnings (Dechow and Dichev 2002, 53). To the extent abnormal accruals exhibit less earnings persistency than normal accruals or cash flows, earnings quality is hampered by the magnitude of abnormal accruals included in total current earnings. Earnings quality is thus closely related to accrual quality. Dechow and Dichev (2002) construct a measure of overall accrual quality and proceed to investigate the relation of their measure of accrual quality to certain firm characteristics.

Dechow and Dichev (2002, 37-41) construct a measure of accrual quality as the standard deviation of residuals from a firm-level time series regression of the change in working capital accruals regressed on past, current and future cash flows from operations. This measure of accrual quality is the extent to which working capital accruals result in operating cash flow realizations. The constructed measure of accrual quality is then correlated to certain firm characteristics expected to be related to accrual quality. Dechow and Dichev find accrual quality to be negatively correlated with the length of operating cycle, decreasing firm size, volatility of sales, volatility of cash flows, volatility of accruals, volatility of earnings, the frequency of reporting negative earnings and the magnitude of accruals. The negative correlations are highest for the volatility of earnings, the average level of working capital accruals, the volatility of accruals, and for the proportion of reporting negative earnings. It is then suggested that these variables can be used as reliable instruments for accrual quality, especially the volatility of earnings and accruals. (Dechow and Dichev 2002, 43-49.)

A positive relationship between the constructed measure of accrual quality and the persistency of earnings is discerned (Dechow and Dichev 2002, 49-53). Low accrual quality results in low quality of earnings, as measured by earnings persistency. Since the level of accruals is strongly

correlated with the constructed measure of accrual quality, Dechow and Dichev (2002, 51) present both their measure of accrual quality and the total level of accruals as useful proxies for the true accrual and earnings quality. The constructed measure of accrual quality is a more accurate proxy for true accrual and earnings quality, whereas the level of accruals is a more practical measure to use (Dechow and Dichev 2002, 53). Dechow and Dichev (2002, 47) note that Sloan (1996) measures accrual and earnings quality by the total level of accruals. In conclusion, the total level of accruals is able to capture the overall accrual quality. As accrual quality is closely related to earnings quality, this suggests that neglecting the reported level of accruals in earnings results in neglecting accrual quality, and ultimately, earnings quality.

### **3.2 Growth-based explanations**

The first approach to accrual anomaly discussed above stresses the inherent erroneousness in the accruals process, arguing that the lack of earnings persistency of accruals is due to accrual errors, whether unintentional or intentional. For whatever reason, the financial markets seem unable to value appropriately the inherent erroneousness of the accrual component. Against this approach to accrual anomaly, the second approach argues that the lower earnings persistency of the accrual component is due to growth-related effects. The approach stressing errors in the accruals process and the growth-related approach differ in regard to whether the lower earnings persistency of accruals is due to inherent erroneousness or to their role as a component of growth in net operating assets, and which one of these is mispriced by the financial markets.

The accurate explanation for the causes of accrual anomaly has important consequences for financial accounting, and thus for practitioners and standard-setters. If the relative lack of earnings persistency of accruals is due to unintentional or intentional errors relating to the accruals process, this should be taken into account when considering the move towards fair value accounting and introducing more subjectivity into financial statements (Richardson, Sloan, Soliman and Tuna 2006, 715). On the other hand, if the growth-based explanations discussed in this section account for the lack of earnings persistency in accruals, then it is the case that accruals do not inherently lower earnings quality significantly, and another proxy should be discovered for earnings quality. (Zhang 2007, 1335).

Zhang (2007, 1336) asserts that the investment perspective of accruals is surprisingly underrepresented in the literature compared to its earnings measurement perspective, although

accruals measure investment in working capital by definition. Working capital is an integral part of overall business growth (Zhang 2007, 1338), and the growth-related perspective to accrual anomaly argues that accruals reflecting firm growth are less earnings persistent due to diminishing marginal returns to further investments, and conservative bias in accounting procedures. Conservative bias in accounting procedures results in investments appearing relatively less profitable in early years and more profitable in later years. (Fairfield, Whisenant and Yohn 2003, 354-356; Richardson et al. 2006, 714.)

Fairfield, Whisenant and Yohn (2003, 354-355, 369) disaggregate total growth in net operating assets into accruals and growth in long-term net operating assets, to investigate whether the lack of earnings persistency and mispricing of accruals is due to growth related effects or accrual errors. To this effect, they advance a hypothesis that accruals and growth in long-term net operating assets should have equivalent incremental negative relations with one-year-ahead profitability. This rests on the assumption that if this equivalence holds, then the lack of earnings persistency in accruals is less likely to relate to earnings management and errors in accruals, but to the effect of growth in net operating assets (Fairfield et al. 2003, 359). The negative relationship between growth in net operating assets and one-year-ahead profitability should then be manifested as the accrual anomaly to the extent investors misprice accruals along with mispricing the growth in long-term net operating assets. (Fairfield et al. 2003, 355-356.)

Regression analysis reveals that after controlling for current profitability, growth in long-term net operating assets and accruals are both negatively related to one-year-ahead profitability, with coefficients of similar magnitude. Furthermore, after controlling for growth in net operating assets, there is no significant difference between the earnings persistency of accruals and cash flows. (Fairfield et al. 2003, 362-364.) These results would indicate that growth in net operating assets subsumes the lack of persistency in earnings, instead of errors in the accrual component.

Market pricing tests reveal that market valuation coefficients (market predictions) outweigh the forecast coefficients (actual predictive ability) of growth in long-term net operating assets and accruals to a similar extent (Fairfield et al. 2003, 364-369). Fairfield et al. (2003, 368-369) conclude that accrual anomaly may be one manifestation of the more general anomaly of mispricing growth in net operating assets. As to the results of prior research indicating market mispricing of abnormal accruals, Fairfield et al. (2003, 369) suggest that these studies may

either have identified contexts in which earnings management is a central issue or have omitted growth in net operating assets from the research design.

Zhang (2007, 1334) recognizes that the approach stressing accrual errors and the growth-based approach are not mutually exclusive in explaining the accrual anomaly, and is concerned to test which factor is more dominant. Zhang attempts to disentangle accrual erroneousness from growth as causes for the accrual anomaly by investigating the co-variation between accruals and employee growth and the implications this co-variation has for accrual anomaly and future earnings development (Zhang 2007, 1334-1335.) If accruals capture fundamental investment information, they should co-vary with other growth attributes and the magnitude of the accrual anomaly should be positively related to this co-variation. Provided that the investment is optimal, future earnings should increase with accruals and the increase should be more pronounced with the co-variation between accruals and other growth attributes. (Zhang 2007, 1338-1339.)

Zhang establishes the co-variation between accruals and growth in the number of employees, and by applying regression and portfolio approaches finds that accrual anomaly varies strongly with the co-variation between accruals and employee growth. These results present evidence against the argument for the inherent erroneousness of accruals. (Zhang 2007, 1346-1351.) As regards future earnings development, the co-variation between accruals and employee growth is positively related to longer-term future earnings growth, supporting the investment argument still further. Results for one-year-ahead earnings support both of the arguments, as earnings growth is negatively correlated with both the co-variation between accruals and employee growth and the earnings persistency of accruals. (Zhang 2007, 1351-1361.) Zhang (2007, 1361) concludes that the fundamental investment information contained in accruals has a first-order effect on the accrual anomaly, whereas the accrual persistency due to accrual errors is likely to have only a second-order effect.

Richardson et al. (2006) arrive at opposite conclusions, arguing for a primary role for accrual distortions, and only a secondary role for growth based explanations. Fairfield et al. (2003) argue that growth in net operating assets subsumes the lack of persistency in accruals. Richardson et al. challenge their reasoning and present additional evidence indicating that both growth and accounting distortions play a significant role in earnings persistency and accrual

anomaly. Accounting distortions are found to have a more pronounced role. (Richardson et al. 2006, 714-715).

First, they challenge the reasoning behind diminishing returns as an explanation for the lower earnings persistency of the accrual component. Fairfield et al. (2003) cite Stigler (1963) for the reasoning behind diminishing returns, which Richardson et al. (2006, 721) argue is applicable to the context of the whole economy but that it does not apply at the individual firm level. Secondly, Richardson et al. (2006, 720-721) dispute the interpretation of results indicating that growth is responsible for the lack of earnings persistency of the accrual component. They argue that Fairfield et al. (2003) fail to consider that not only working capital accruals, but also long-term operating assets are manifestations of accrual accounting, and thus susceptible to the same distortions as short-term accruals. Therefore, the findings by Fairfield et al. (2003) indicating that growth in net operating assets subsumes the lack of persistency in earnings does not by itself demonstrate that accounting distortions do not play a role. As Richardson et al. (2006, 720) note, the results concerning the net operating assets are consistent with both explanations.

Richardson et al. (2006) then seek to discriminate between the two competing explanatory approaches to accrual anomaly. They incorporate noncurrent assets to their definition of accruals as well, and decompose accruals further to two components designed to capture “growth” and “efficiency”. Growth component of accruals is designed to capture the change in accruals related to real investment growth, whereas the efficiency component is designed to capture either accounting distortions or less efficient use of existing capital. Growth component is captured by sales growth (assuming sales growth to lead to proportional increases in accruals) while the efficiency component is defined by net operating asset turnover. (Richardson et al. 2006, 721-723.)

Regressing one-year-ahead profitability on the decomposition of accruals into growth and efficiency components, while controlling for current profitability, indicates that the growth component and the efficiency component are both negatively related to one-year-ahead profitability, with a slightly larger and statistically more significant coefficient on the latter. Richardson et al. interpret the negative coefficient of the efficiency component to be consistent with accounting distortions, while considering the negative coefficient of the growth component to be indicative of either diminishing returns to new investment or accounting distortion in sales. The results suggest a significant role for accounting distortions in explaining

the lower earnings persistency of the accrual component of earnings, with a supplementary role for diminishing returns to new investment. (Richardson et al. 733-735.)

Richardson et al. (2006) supplement their evidence for the primacy of accounting distortions by investigating the relationship between accruals and SEC enforcement actions. Richardson et al. (2006, 738) interpret the results as suggesting that: “...for the SEC enforcement action subsample, the properties of accruals are attributable to temporarily aggressive accounting rather than interaction of permanently aggressive accounting with growth in real investment.”

In conclusion, Richardson et al. (2006, 741) interpret their results as suggesting that temporary accounting distortions play an important role in explaining the lower earnings persistency of the accrual component of earnings, with some of the accounting distortion attributable to intentional managerial manipulation of accruals. At the same time, they are also unable to rule out a supplementary role for growth-based explanations.

Recent research by Allen, Larson and Sloan (2013) synthesizes the two approaches. They decompose accruals into “good accruals” and “accrual estimation errors” to examine the relative importance of “good accruals” as against “accrual estimation errors” in driving accrual reversals, and how each accrual component relates to earnings persistency and future stock returns:

*“Accruals represent managers' forecasts of future benefits and reverse when either (i) the anticipated future benefits are realized or (ii) new evidence indicates that the anticipated future benefits are unlikely to be realized. Accordingly, we decompose accruals into (i) accruals that correctly anticipate future benefits and (ii) accrual estimation errors.”*

(Allen et al. 2013, 113-114.)

It is predicted that the good accruals further consist of two components: a positively serially correlated component related to growth in the underlying business and a negatively serially correlated component related to temporary fluctuations in working capital (Allen et al. 2013, 116). The positively serially correlated component related to growth is a persistent process relating to firm growth, whereas the fluctuations in working capital are a reversing process. Accrual estimation errors are also a reversing process, and thus have to be distinguished from

the “good fluctuations” relating to working capital fluctuations (Allen et al. 2013, 127). Accrual estimation error is predicted to reflect the lower reliability of the total accrual component of earnings, neither persisting nor predicting future earnings, thus lowering earnings quality (Allen et al. 2013, 116). Accrual estimation error is also predicted to be responsible for the negative relationship between accruals and future stock returns.

After establishing that “good accruals” consist of the two serially correlated components as predicted, it is then demonstrated that accrual estimation error is indeed the least persistent component of earnings. The growth component of good accruals also contributes to the lower persistency of the accrual component of earnings, consistent with the growth-based explanations of diminishing returns to new investment. Good accruals relating to temporary fluctuations in working capital, the “good fluctuations”, are found not to contribute to the lower persistency of the accrual component of earnings. (Allen et al. 2013, 123-126.) The investigations concerning the relationship between accruals and future stock returns present similar results as the investigations on earnings persistency: the negative relationship is due to both accrual estimation error and firm growth components of the accruals (Allen et al. 2013, 126-127).

Fairfield et al. (2003) discovered that after controlling for growth in net operating assets, there is no significant difference between the earnings persistency of accruals and cash flows. Richardson et al. (2006) demonstrated that the growth in net operating assets may have subsumed the accrual distortions in Fairfield et al. (2003) due to their method in defining accruals and long-term assets. By meticulously decomposing accruals into “good accruals” and “accrual estimation errors” it may indeed be discerned that the “good fluctuations” may have subsumed the “accrual estimation errors” in Fairfield et al. (2003), as these two components were not decomposed in their research. The evidence presented for the growth component of good accruals contributing both to the lower persistency of the accrual component of earnings, and to the negative relationship of accruals with future stock returns, supports also the argument by Fairfield et al. (2003) that diminishing marginal returns to further investment explains much of the accrual anomaly.

The results by Allen et al. (2013) support both approaches to accrual anomaly, suggesting that both accrual errors and diminishing marginal returns to further investment play a significant

role. Investors seem unable to correctly anticipate the lower earnings persistency of the accrual component, which is due to both accrual errors and diminishing marginal returns to growth.

### **3.3 International evidence**

All of the previously reviewed studies were conducted in the context of the U.S. capital markets. The question remains whether the accrual anomaly is only a U.S. based phenomenon or whether it is internationally generalizable. Pincus, Rajgopal and Venkatachalam (2007) investigate this question and whether the accrual anomaly is associated with country-level accounting and institutional structures. Pincus et al. find that the accrual anomaly occurs in the pooled sample of non-U.S. common law countries but not in the pooled sample of code law countries. On an individual country level, significant accrual overweighting is only found in Australia, Canada, U.K. and the U.S. Inconsistent with Sloan (1996), they find that accruals over- or underweighting does not necessarily imply operating cash flow under- or overweighting and vice versa. (Pincus et al. 2007, 171-180.) Abnormal returns tests also indicate that abnormal returns can be earned by an accruals-based strategy only in these four common law countries (Pincus et al. 2007, 189-193).

Pincus et al. devise six testable explanatory hypotheses for this connection between accrual anomaly and common law. These hypotheses are based on potential systematic differences across countries regarding legal tradition and properties of capital markets. Four of these hypotheses are found significant. Accrual anomaly is positively related to common law tradition, the extent of accrual accounting permitted, the dispersion of ownership of shares and weak outside shareholder rights. (Pincus et al. 2007, 180-189.) Pincus et al. suggest that a common law system reflects a “shareholder model” of corporate governance, whereas a code law system reflects a “stakeholder model” of corporate governance, which results in differing access to inside information. In code law countries a wider range of stakeholders is suggested to have access to inside information and accrual anomaly is traded away (Pincus et al. 2007, 176). Dispersion of ownership is also connected with less access to inside information (Pincus et al. 2007, 183). More extensive accrual accounting is more likely to result in errors and offers more opportunities for earnings management. Earnings management is further exacerbated by weak shareholder rights and weak enforcement of these rights (Pincus et al. 2007, 181-182). As for the explanation of accrual anomaly itself and reasons for its persistency, Pincus et al. find

that earnings management by accruals manipulation is responsible for the occurrence of the anomaly, and that barriers to arbitrage explain its persistency (Pincus et al. 2007, 194-197).

Kaserer and Klingler (2008) extend this line of research by arguing that accrual mispricing is to be explained by the interaction between the corporate governance system and the accounting standard in place. They proceed to investigate the interaction between these two institutional factors by investigating the effect of switching from domestic accounting standards to either IFRS or US-GAAP. This switch took place in German capital markets in the decade from 1995 to 2005. By keeping the corporate governance regime constant, the impact of a change in accounting standards is isolated. (Kaserer and Klingler 2008, 837-840.)

Kaserer and Klingler state that IFRS and US-GAAP are conventionally thought to provide more accurate financial information due to fair value accounting than conservative accounting systems, such as German-GAAP. Conservative accounting systems, combined with historical cost accounting, are thought to result in certain systematic errors in accounting information and to allow for easier earnings manipulation. However, Kaserer and Klingler argue that it is not clear which of the accounting standards results in more accurate information. Since fair value accounting relies on incorporating a substantial amount of difficult-to-verify information, this may leave much more room for error and management discretion (Kaserer and Klingler 2008, 838-842.)

The persistency of earnings components with respect to future earnings is first investigated. Kaserer and Klingler find evidence of decreasing earnings persistency of the accrual component under fair value accounting, while the earnings persistency of the cash flow component is unaffected by the accounting standard. The decrease in the earnings persistency of the accrual component occurs mainly in financial statements published over the period from 2000 to 2002, suggesting that this is probably due to the switch to international accounting standards. (Kaserer and Klingler 2008, 850-851.) In line with this finding, they also find significant investor overweighting of accruals for firms complying with international accounting standards for the same time period from 2000 to 2002 (Kaserer and Klingler 2008, 851-857.) Kaserer and Klingler conclude that accrual anomaly in Germany is driven by the change in accounting standards from conservative historical-cost accounting regime of the German-GAAP to fair value accounting under international accountings standards.

They present this as preliminary evidence of fair value accounting having a positive connection to the occurrence of accrual anomaly, at least under a weak corporate governance system. Under a weak corporate governance system, involving weak enforcement of accounting standards, fair value accounting may be abused, resulting in erroneous accruals and lower earnings quality. The results support the findings by Pincus et al. (2007) regarding the connection between accrual anomaly and more extensive accrual accounting, as well as between accrual anomaly and weak shareholder rights enforcement. However, Kaserer and Klingler qualify their conclusions to some extent. They suggest that their results may be driven by the novelty of the international accounting standards to the German context and by the unusually high stock market volatility in the period from 2000 to 2002. (Kaserer and Klingler 2008, 857-858.)

### **3.4 Persistency of accrual anomaly**

Whatever the causes for the occurrence of accrual anomaly may be, it is quite remarkable that it has continued in existence, and has not been arbitrated away. Lev and Nissim (2006) investigate the investor response to accruals and the reasons for the persistency of accrual anomaly. They first establish that accrual anomaly persists and that its magnitude has not diminished over the sample period from 1965 to 2003 (Lev and Nissim 2006, 7-11). This suggests that the response to accruals information by institutional investors has been untimely or insufficient.

Lev and Nissim classify institutional investors into three groups by their trading intensity, in order to investigate the timeliness and magnitude of accruals-based trading by institutional investors in the time period from 1982 to 2001. They find that transient institutions, institutions trading frequently for short-term profits from price changes, do indeed react to accruals expediently. The reaction of transient institutions is strongest in the first quarter of the subsequent year, in which annual earnings and accruals of most companies are publicly reported. The reaction to accruals is also quite strong in the second and last quarter of the subsequent year. Moreover, the reaction for the 1992 to 2001 period has been twice as large as that for the prior ten years. (Lev and Nissim 2006, 11-18.) The reaction by transient institutions to accruals information is shown to precede the change in stock price (Lev and Nissim 2006, 19-21). The response to accruals by non-transient institutions has appeared only in the 1990s and only in the first quarter of the subsequent year. The reaction by non-transient institutions in the first quarter has however been greater in magnitude to that of the transient institutions.

The evidence indicates that institutions as a whole traded more actively on accruals information during the 1990s than in the previous decade. (Lev and Nissim 2006, 15.) Transient institutions are shown to trade actively and expediently on accruals information, yet, accrual anomaly persists. Lev and Nissim calculate that accruals-related ownership change for extreme-accrual firms amounts to less than 10 percent of the mean ownership change in the first calendar quarter and about 10 percent of the median change – magnitudes not enough to affect the accrual anomaly (Lev and Nissim 2006, 22).

Lev and Nissim investigate the characteristics of extreme-accrual firms and conclude that small size and low book-to-market ratio keep institutional investors from taking significant positions in these firms (Lev and Nissim 2006, 22-25). Prudent-man laws and liquidity concerns contribute to this willingness to leave a profitable trading strategy unexploited. “High-quality assets” – investments in large, mature, profitable and high book-to-market companies - are easier to defend in courts in case investors seek damages from the institutional investor on the basis of prudent-man laws. (Lev and Nissim 2006, 25-26.) High information-processing and transaction costs prevent individual investors from implementing an accruals-based trading strategy (Lev and Nissim 2006, 27-30). Lev and Nissim (2006, 30) conclude that because of these hindrances for both institutional and individual investors, the accrual anomaly will endure for quite some time.

Against this prediction made by Lev and Nissim (2006), Green, Hand and Soliman (2011) present evidence that accrual anomaly has demised from its peak in 2000. Green et al. report conflicting views among academics and practitioners regarding the implementability of accruals-based trading strategy, academics being skeptical while practitioners actually applying accrual-based models. They then proceed to investigate the degree to which accrual anomaly has continued to earn positive abnormal returns. Green et al. propose several alternative explanations for the demise of accrual anomaly, with their primary explanatory factor being the attention of hedge funds towards exploiting the anomaly. (Green et al. 2011, 797-799.)

Green et al. divide their sample period into three sub-periods: (1) the pre-Sloan sub-period from July 1970 to December 1995; (2) the early post-Sloan sub- period from January 1996 to December 2003, which is the last year of returns data used by Lev and Nissim (2006); and (3) the late post-Sloan sub-period from January 2004 to March 2010. Most of the annual returns to

implementing an accruals based trading strategy were positive for the first two sub-periods. However, for the last sub-period starting in 2004, returns were not typically positive anymore. (Green et al. 2011, 799-804.) Green et al. then investigate various explanations for this demise, inferring that it stems from an increase over time in the capital invested by hedge funds into exploiting the accrual anomaly, and in part from a decline over time in the size of the mispricing of accruals (Green et al. 2011, 804-813).

Hedge funds are hypothesized to be in the forefront of exploiting accrual anomaly for their “operational flexibilities” (e.g. they are unregulated, can short sell at a low cost, do not calibrate their performance to benchmarks, face lower litigation costs) and for the explosive growth in the number of hedge funds and the value of assets they manage since early 2000s. Green et al. also propose hedge funds to have significantly increased their ties to key senior accounting academics, including Richard Sloan, and employed a number of these academics. (Green et al. 2011, 798-799, 800, 804-805.)

The decline in the size of the mispricing of accruals is also due to both decline in the size of extreme accruals and decline in the diverging earnings persistency of cash flows and accruals (Green et al. 2011, 807-812). The decline in the size of extreme accruals may also indicate a decline in earnings management (Green et al. 2011, 806). Although their results are low-powered, Green et al. conclude that the increase in the capital employed by hedge funds to exploit accrual anomaly plays a primary part in the demise of the accrual anomaly, with the changes in the magnitude of extreme accruals and in the persistency of earnings components in the secondary role (Green et al. 2011, 813-815).

### **3.5 Skepticism regarding the existence of accrual anomaly**

Fama and French (2008) revisit the size, value, growth, accruals, net stock issues, and momentum anomalies, to investigate whether the anomalies are pervasive across size groups. Fama and French note that microcap stocks can dominate sorts of returns on anomaly variables and cross-section regressions since, despite their small proportion of the total market cap, they account for around 60 % of the total number of stocks. Also the cross-section dispersion of anomaly variables is largest among microcap stocks. Therefore, Fama and French examine the average returns separately for microcap stocks, small stocks and big stocks. (Fama and French 2008, 1654.)

The results from sorts of returns find accrual anomaly to be pervasive across all size groups, along with anomalies related to net stock issues and momentum. However, the returns to accrual anomaly do not vary systematically from the low to the high end of the sorts. Extreme negative accruals are followed by positive abnormal returns, and extreme positive accruals are typically followed by negative abnormal returns. However, for small and big stocks positive abnormal returns for extreme negative accruals are less than two standard errors from zero. Thus, the abnormal returns from accruals sorts are not always statistically reliable across size groups even in the extremes, without the added emphasis provided by long-short hedge portfolios. And less extreme accruals, positive or negative, tend to be followed by positive abnormal returns that do not decline much across the cells of the sorts. Except for microcaps, the abnormal returns associated with less extreme accruals are rather close to zero. (Fama and French 2008, 1658-1666.)

Regression approach reveals that the average slopes for positive accruals in all size groups are negative, but not consistently strong, as measured by their statistical significance. Negative coefficients are strongest for microcap stocks and weakest for big stocks. The average slopes are however similar across all size groups and estimating the regression model with the full sample reveals that the average slope from the regressions for all stocks is strongly statistically significant. Positive accruals are inferred to be associated with lower future returns. Standard errors for negative accruals are very close to zero with the regression approach. This is inconsistent with the strong positive average returns for the negative accruals obtained from the sorts of returns. Fama and French suggest that this is due to a peculiar relationship between negative accruals and returns, and that the regressions might therefore be improved by replacing negative accruals with a dummy variable.

Fama and French conclude that much of the action in anomaly returns, including accrual anomaly returns, is in the extremes. This is due to the fact that much of the action in the anomaly variables themselves is in the extremes. (Fama and French 2008, 1666-1674.) Referring to an earlier study by the authors (Fama and French 2006), Fama and French evoke their standard valuation equation to reach a unifying logic for all the anomalies. The standard valuation equation implies that, when controlling for book-to-market-ratio, higher expected net cash flows imply higher expected stock returns. Despite the evidence of persistent abnormal returns

for certain anomalies, including the accrual anomaly, Fama and French deny that market inefficiency can necessarily be deduced from the evidence.

Fama and French propose all of the anomaly variables to be proxies for expected cash flows. The negative relationship between average returns and accruals is consistent with the valuation equation, since firms with more accruals tend to have lower net cash flows. The reason why Fama and French deny that the average returns associated with anomaly variables are evidence of market inefficiency is that the valuation equation does not determine whether the differences in expected returns are due to irrational pricing or rational risk aversion. (Fama and French 2008, 1675-1676.) Thus, according to Fama and French (2008), there may or may not exist an accrual anomaly, despite the abnormal returns to accruals.

Kraft, Leone and Wasley (2007) argue that the accrual anomaly is illusory and vanishes once explanatory variables are added to the Mishkin-test-model applied by Sloan (1996) and numerous researchers since. Their argument has its basis in the conflicting findings between macroeconomic efficiency and accounting inefficiencies regarding the financial markets, which are reached by the same method. Kraft et al. investigate whether the results in accounting studies are evidence of market inefficiency or misspecification of the Mishkin-test-model. (Kraft et al. 2007, 1082.)

Kraft et al. argue that the Mishkin-test-model does not appear to be completely understood by accounting researchers, as regards the omitted variables problem similar to that of conventional regression-based tests (Kraft et al. 2007, 1083). Kraft et al. (2007, 1084) state that:

*“...based on the MT one can reject efficiency (at least with respect to the assumed equilibrium model of returns) even if the forecasting equation has omitted variables, but one cannot draw inferences about which accounting variable or variables are the source of the inefficiency... Only if the omitted variables themselves are rationally priced is their exclusion from the MT irrelevant.”*

As additional explanatory variables are introduced into the model, Kraft et al. document the accrual anomaly reported in Sloan (1996) and numerous studies since to disappear. Accrual overweighting is only found in the most extreme accrual decile portfolio. Mispricing of cash flows nevertheless persists. (Kraft et al. 2007, 1096-1111.) However, no explanation is offered

for the abnormal returns generated by the accrual-based trading strategies presented in Sloan (1996) and other studies.

### **3.6 Summary of previous research**

Even this extended literature review only scratches the surface of research on accrual anomaly. The extent of research on this subject is unusually wide and still advancing in the present day. Great amount of interesting research is necessarily omitted from this literature review. The main purpose of the literature review was to introduce the main lines of research into the accrual anomaly.

The approaches in explaining the causes for the accrual anomaly fall roughly into the following three categories: (1) the lack of persistency in the accrual component of earnings is due to unintentional or intentional accrual errors, which investors are unable to price correctly, (2) the lack of earnings persistency in accruals is due to diminishing marginal returns to further investment, and accrual anomaly is a part of a larger anomaly of investors mispricing growth in net operating assets, (3) accrual anomaly is illusory, which further divides into (i) risk-based explanations, where higher returns to accrual-based trading strategies are due to accommodating more risk instead of revealing market inefficiencies, and (ii) suggestions of flawed research design in previous research, which indicates an anomaly where there isn't one. Recent research by Allen et al. (2013) synthesizes the first two of these competing approaches, suggesting that the lack of earnings persistency in accruals and the mispricing of accruals are due to both accrual errors as well as diminishing marginal returns to further investment.

As regards the risk-based explanations which deny the existence of accrual anomaly, it should be noted that the research in accrual anomaly does inevitably face the “joint hypothesis problem” associated with financial market efficiency studies. The results of empirical analysis may indicate that financial markets are indeed inefficient, or either they may indicate that the underlying asset pricing model is flawed – or both. The conclusion between these alternatives cannot be drawn decisively. As long as the underlying asset pricing models cannot be demonstrated to be unreasonable or erroneous, previous research indicating the existence of accrual anomaly may be held to be valid.

Considering the suggestion of flawed research design in previous research, it may be stated that whatever the problems associated with previous research designs, it is nevertheless documented that an accruals-based trading strategy yields abnormal returns. This suggests accruals to be connected with some market inefficiency. Dechow, Khimich and Sloan (2011, 21) propose that as long as a compelling reason for an alternative explanation is not identified, accruals themselves may be held to be the cause of these results.

International evidence finds accrual anomaly occurring only in the common law countries of the U.S., U.K., Canada and Australia. Pincus et al. (2007) devise six testable explanatory hypotheses for this connection, finding four of them significant: accrual anomaly is positively related to common law tradition, the extent of accrual accounting permitted, the dispersion of ownership of shares and weak outside shareholder rights.

Kaserer and Klingler (2008) put these explanatory hypotheses to test as they investigate the transition from conservative German accounting standards to international accounting standards which emphasize fair value accounting. The transition towards international accounting standards is a transition to an accounting standard more akin to those developed under common law tradition. The results by Kaserer and Klingler (2008) indicate that the transition to international accounting standards reduced the earnings persistency of the accrual component, and resulted in accrual overweighting by the financial markets.

Any trading strategy producing abnormal returns would be expected to be exploited to the degree that any abnormal returns would ultimately vanish. However, Lev and Nissim (2006) document accrual anomaly to have persisted ever since its discovery. They propose that prudent-man laws and liquidity concerns contribute to the willingness by institutional investors to leave a profitable trading strategy unexploited, while high information-processing and transaction costs prevent individual investors from implementing an accruals-based trading strategy. However, Green et al. (2011) present evidence that the accrual anomaly has demised from January 2004 to March 2010. Green et al. (2011) explain this demise to result mainly from an increase over time in the capital invested by hedge funds into exploiting the accrual anomaly.

## **4 Institutional setting and hypothesis development**

### **4.1 Institutional setting**

In order to form testable hypotheses regarding accrual anomaly in the Finnish institutional setting, this institutional setting must first be evaluated. In the following section, the Finnish institutional setting will be evaluated by certain legal and cultural factors, which the previous research has found to be associated with the accrual anomaly. These factors include the extent of accrual accounting permitted, structure of share ownership, outside shareholder rights and relative strength of the corporate governance regime (e.g. Pincus et al 2007; Kaserer and Klingler 2008), quality of financial statements and disclosures, and the inclination towards earnings management (e.g. Xie 2001). It will then be assessed whether any clear expectations regarding accrual anomaly in the Finnish institutional setting may be formed. On the basis of these expectations, the exact testable hypotheses will be formulated. There are of course no absolute measures of the legal and cultural factors considered, only relative comparisons between different institutional settings. Therefore the Finnish institutional setting is compared to Germany, and to the common law countries of UK and the U.S.

#### **4.1.1 Code law tradition and conservative accounting standards**

Pincus et al. (2007) found accrual anomaly to be positively related to common law tradition, because the common law tradition allows for more extensive accrual accounting practices than accounting legislation under code law tradition. Kaserer and Klingler (2008) argue that the true and fair value accounting framework of international accounting standards (IFRS/U.S. GAAP) allows for more flexibility in accrual manipulation than conservative German accounting standards. Common law and code law traditions also reflect differing models of corporate governance. The “stakeholder model” of corporate governance associated with code law tradition allows for wider access to inside information, which can be used to trade away the accrual anomaly. Finland has a code law tradition, with its accompanying conservative accounting standards (preceding transition to IFRS), along with a “stakeholder model” of corporate governance. This would speak against the occurrence of accrual anomaly, at least in the time period before the transition to IFRS.

### **4.1.2 The structure of share ownership in Finland**

Ownership of shares in the Finnish publicly owned companies has traditionally been highly concentrated. High concentration of share ownership reduces the information asymmetry between owners and management, reducing opportunistic earnings management. Access to inside information is also gained through concentrated ownership. High concentration of share ownership is therefore negatively related to the occurrence of the accrual anomaly.

In a 1997 overview study of 54 Finnish publicly listed companies, largest shareholder in 19 of the companies held under 20 percent of votes, largest shareholder in 22 of the companies held 35 percent of votes and largest shareholder in 13 of the companies held over 50 percent of votes. Only in 17 of the companies did five largest shareholders combined hold under 50 percent of votes. (Hakala 1997, 59-64.) The relatively high concentration of share ownership in Finnish publicly listed companies would speak against the occurrence of accrual anomaly in the Finnish institutional setting.

### **4.1.3 Shareholder rights and corporate governance**

A seminal study by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) - examining legal rules covering protection of corporate shareholders and creditors, and the quality of their enforcement – has become one of the most widely influential studies on the connection between law and economics. It introduced an index of six shareholder protection rules in forty-nine countries (the “antidirector rights” index), which attempts to quantify legal environments in this regard. This quantification has been used in over a hundred published empirical studies since its introduction. (Spamann 2010, 467-468.)

On this “antidirector rights” index, Finland is found to enforce three out of six designated shareholder protection rules. By comparison, the common law countries U.K. and the U.S. with their strong investor protection traditions enforce five of the six shareholder protection rules, whereas Germany enforces only one of these. (La Porta et al. 1998, 1130-1131.) These results reflect the common notion of the greater distance between stakeholders and management under common law, which raises the demand for investor protection (e.g. Ball et al. 2000, 13-15).

While recognizing the pioneering work by La Porta et al. (1998), Spamann (2010) criticizes their construction of the “antidirector rights” index on certain methodological accounts. On a revised index, Spamann (2010, 475) acquires the value of four for “antidirector rights” in Finland and Germany. U.K. has a revised value of four and the U.S. only two (Spamann 2010, 475). Spamann (2010, 468) notes that Djankov, La Porta, Lopez-de-Silanes and Shleifer have since revised their index as well. Their revised “antidirector rights” index has a value of 3,5 for Finland and Germany both, five for U.K. and 3 for the U.S. (Spamann 2010, 475) In conclusion, the “antidirector rights” index in its many revised forms seems to be fairly even for Finland, although not for the U.S. or Germany, which puts any conclusions based on these indexes somewhat suspect.

In addition to these “antidirector rights” indexes, there are various other attempts at a quantification of investor protection and corporate governance practices. McLean, Zhang and Zhao (2012) study the effects of investor protection on investment, finance and growth. Their description of Finland with regard to country-level measures of investor protection places Finland in the third quintile on both their “investor protection index” and “anti-self-dealing index”. The latter index captures the regulation of transactions between two firms controlled by the same person. U.K. and the U.S. are placed in the top quintiles on both indexes. Germany is placed in the bottom quintile on the “investor protection index” and in the second quintile on the “anti-self-dealing index”, (McLean et al. 2012, 323-324; 346-348.)

Bushman, Piotroski and Smith (2004) investigate whether corporate transparency varies internationally with legal regimes and political economies. Corporate transparency is measured by various financial reporting and transparency factors. On governmental transparency factor Finland is placed in the fourth quintile. The U.S. is in the second quintile while U.K. is placed in the top quintile. Germany is placed in the second quintile. On governance disclosure, Finland is placed in the fourth quintile, while Germany is placed in the second quintile. U.K. is again in the top quintile while the U.S. makes it in the third quintile.

Hope (2003) investigates the relationship between earnings forecast accuracy and the level of annual disclosure, as well as between earnings forecast accuracy and the degree of enforcement of accounting standards on a country-by-country basis. Finland ranks in the third quintile on enforcement of accounting standards, while Germany is based in the bottom quintile, among the countries with the lowest enforcement scores. Kaserer and Klingler (2008) use these results

in Hope (2003) to describe the German institutional setting as a weak corporate governance regime. U.K. and the U.S. rank among the top quintiles.

#### **4.1.4 Quality of financial statements and earnings management**

Bushman et al. (2004) measure corporate transparency with a financial transparency factor, disclosure score, and by a rating in accounting standard. On financial transparency factor, Finland ranks in the fourth quintile and in the top quintile on disclosure score. Germany ranks in the top quintile on both measures. U.K. and the U.S. also rank in the top quintiles. On a rating in accounting standard, which is an index created by rating companies' annual reports on their inclusion or omission of a number of items, Finland ranks in the top quintile. U.K. and the U.S. also rank in the top quintiles. Germany ranks low in this regard, ranking in the second quintile.

Haw, Hu, Lee and Wu (2012) use a modified Jones-model for discretionary accruals as a proxy for earnings quality. They find earnings quality in Finland to be in the fourth quintile. Earnings quality for Germany is in the bottom quintile. U.K. is placed in the bottom quintile as well. Leuz, Nanda and Wysocki (2003) examine systematic differences in earnings management across 31 countries. They construct aggregate earnings management scores for the countries involved, indicating the extent of earnings management practiced. Finland is placed in the second quintile whereas Germany is in the fourth, implying high earnings management in Germany. U.K. is placed in the second quintile as well. The U.S. has the smallest earnings management score of the countries involved in the study, indicating the least amount of earnings management.

Nabar and Thai (2007) study the impact of investor protection and national culture on earnings management. Their results indicate earnings management to be negatively associated with outside shareholder rights and positively associated with uncertainty avoidance. Nabar and Thai (2007) base their notion of uncertainty avoidance on the work by Geert Hofstede, which studies national cultural differences. Hofstede (2010, 192-195) describes Finland as having a medium high preference for avoiding uncertainty. This would suggest Finland to be prone to earnings management to some extent. Germany is described by Hofstede as a culture with high uncertainty avoidance. U.K. and the U.S. are described as low uncertainty avoidance national cultures. Uncertainty avoidance is in connection with the tendency in code-law

**Table 1**  
Summary of cited research on factors related to accrual anomaly

<b>Finland</b>	<b>Germany</b>	<b>U.K.</b>	<b>U.S.</b>
<b>Code-law</b>			<b>Common law</b>
<b>SHAREHOLDER PROTECTION</b>			
<b>Antidirector rights index <sup>1)</sup></b>			
3/6; 3,5/6; 4/6	1/6; 3,5/6; 4/6	5/6; 5/6; 4/6	5/6; 3/6; 2/6
<b>Investor protection index <sup>2)</sup></b>			
3rd quintile	1st quintile	5th quintile	5th quintile
<b>Anti-self-dealing index <sup>3)</sup></b>			
3rd quintile	2nd quintile	5th quintile	5th quintile
<b>CORPORATE GOVERNANCE</b>			
<b>Governmental transparency <sup>4)</sup></b>			
4th quintile	2nd quintile	2nd quintile	5th quintile
<b>Governance disclosure <sup>5)</sup></b>			
4th quintile	2nd quintile	5th quintile	3rd quintile
<b>Enforcement of accounting standards <sup>6)</sup></b>			
3rd quintile	1st quintile	5th quintile	5th quintile
<b>FINANCIAL STATEMENT QUALITY</b>			
<b>Financial transparency <sup>7)</sup></b>			
4th quintile	5th quintile	5th quintile	5th quintile
<b>Rating in accounting standard <sup>8)</sup></b>			
5th quintile	2nd quintile	5th quintile	5th quintile
<b>Disclosure score <sup>9)</sup></b>			
5th quintile	5th quintile	5th quintile	5th quintile
<b>EARNINGS QUALITY</b>			
<b>Uncertainty avoidance <sup>10)</sup></b>			
medium high preference	high uncertainty avoidance	low uncertainty avoidance	low uncertainty avoidance
<b>Earnings quality <sup>11)</sup></b>			
4th quintile	1st quintile	1st quintile	
<b>Earnings management <sup>12)</sup></b>			
2nd quintile	4th quintile	2nd quintile	1st quintile

*Notes:*

Sources for the variables: 1) *Antidirector rights index*: La Porta et al. (1998); Djankov et al. (2008); Spamann (2010), 2) *Investor protection index*: McLean et al. (2012), 3) *Anti-self-dealing index*: McLean et al. (2012), 4) *Governmental transparency*: Bushman et al. (2004), 5) *Governance disclosure*: Bushman et al. (2004) 6) *Enforcement of accounting standards*: Hope (2003), 7) *Financial transparency*: Bushman et al. (2004), 8) *Rating in accounting standard*: Bushman et al. (2004), 9) *Disclosure score*: Bushman et al. (2004), 10) *Uncertainty avoidance*: Hostede (2013); Nabam and Thau (2007), 11) *Earnings quality*: Haw, Hu, Lee and Wu (2012), 12) *Earnings management*: Leuz, Nanda and Wysocki (2003), higher score indicates more earnings management

countries described by Ball et al. (2000, 31-35) to consider it imprudent to report income in excess of that required to justify dividends and bonuses. This tendency makes code-law countries inherently prone to earnings management, not just in managing earnings upwards, but also downwards.

#### **4.1.5 Conclusions on the institutional setting and expectations**

Accrual anomaly has been positively associated with the following factors: the extent of accrual accounting permitted, dispersion of share ownership, weak outside shareholder rights and corporate governance regime, low quality of financial statements and disclosures, and the inclination towards earnings management.

The results of cited studies on shareholder protection, corporate governance and financial statement quality are summarized in Table 1. Weaknesses in these three factors are associated with the occurrence of accrual anomaly. Finland scores consistently in the upper quintiles on the strength of these factors, still somewhat below the U.S. and U.K. which are considered as strong corporate governance regimes. The overall corporate governance regime of Finland may therefore be described as semi-strong.

The relative strength of shareholder protection, corporate governance and financial statement quality speak against the occurrence of accrual anomaly not just in Finland, but in the U.S. and U.K. as well. This is curious since accrual anomaly has been found to occur most consistently in these two common law countries. The only “pro-accrual anomaly-traits” the U.S. and U.K. are left with are the common law tradition and the relatively higher dispersion of share ownership. The institutional setting in Finland has neither of these traits, in addition to its semi-strong corporate governance regime.

As the Finnish institutional setting does not strongly exhibit any of the traits commonly associated with the accrual anomaly, this results in negative expectations for the occurrence of accrual anomaly - at least for the pre-IFRS sub-period. The transition to IFRS introduces a fair value accounting framework, which brings the implemented accounting standard closer to that of common law regimes. The question then becomes whether this transition to IFRS could bring about the accrual anomaly for the post-IFRS sub-period.

Expectations for the post-IFRS sub-period are however negative as well. Kaserer and Klingler (2008) present evidence that accrual anomaly accompanies the introduction of IFRS. They however qualify their conclusions, by noting that the results are reached under a weak corporate governance regime. The semi-strong corporate governance regime in Finland should prevent any extensions of accrual accounting from resulting in widespread accrual manipulation.

On a final note, the expectations presented above are dependent on the reliability of the cited studies. It is exceedingly difficult to quantify corporate governance regimes and legal environments, a task which would demand implicit knowledge to make meaningful assertions. To this implicit knowledge, researchers simply do not have access. This constitutes a limitation for forming any strong expectations.

## 4.2 Hypotheses

Let us shortly review the research questions before formulating the exact hypotheses to be tested. The first research question concerns the occurrence of accrual anomaly in the Finnish institutional setting. The second research question concerns the effects of the adoption of IFRS on accrual anomaly. The empirical analysis of these two research questions proceeds as follows.

First, it is established whether the accrual and cash flow components of earnings have differing earnings persistency properties, and whether the introduction of IFRS has any effects on these properties. Hypotheses for the first part of the empirical analysis concern the earnings persistency of earnings components and are formulated as follows:

**H1(i):** *Earnings persistency hypothesis (i):* There is no significant difference between the earnings persistency of current cash flow component of earnings and current accruals components of earnings towards one-year-ahead future earnings.

**H1(ii):** *Earnings persistency hypothesis (ii):* The introduction of IFRS has no significant effects on the earnings persistency of current cash flow component of earnings or current accruals component of earnings towards one-year-ahead future earnings.

The first part of the empirical analysis establishes the objective forecasting coefficients for the current earnings components. After establishing this, the two research questions are addressed.

It is investigated whether stock prices correctly reflect the implications of current earnings components for future annual earnings, and whether the introduction of IFRS has any effects on this. This is done by constructing an empirical model, which allows to compare the objective forecasting coefficients to the coefficients financial markets assign to the current earnings components. The latter are referred to as market coefficients. If the market coefficients diverge from the forecasting coefficients, this indicates that stock prices fail to react correctly to the information embedded in the current earnings components. This would constitute a market inefficiency. Hypotheses for the second part of the empirical analysis concern the occurrence of accrual anomaly in Finland and are formulated as follows:

**H2(i):** *Accrual anomaly hypothesis (i):* Financial markets treat earnings persistency of the current earnings components in accordance with their objective forecasting coefficients.

**H2(ii):** *Accrual anomaly hypothesis (ii):* The introduction of IFRS has no significant effects on financial markets estimating current earnings components in accordance with their objective forecasting coefficients.

## 5 Data and variables

### 5.1 Sample data

Empirical studies on accrual anomaly employ both accounting data as well as market data on security returns and control variables. Accrual anomaly studies are tests of market efficiency as the market reaction to publicly available accounting information is tested. Efficient market hypothesis states that market prices for securities should more or less reflect this publicly available information. Accounting data employed in this study is collected from the Thomson Reuters Worldscope database, whereas security returns and data on control variables are obtained from Thomson Financial Datastream database.

The sample consists of the companies included in the OMX Helsinki Index (HEX), which is a market index including all of the publicly listed companies in the Finnish stock market. The returns on HEX are used as a benchmark for the calculation of abnormal returns. Deviations from HEX are considered as abnormal returns. The sample covers the years 1993-2013. Excluded from the final sample are banks, insurance companies and other financial service providers (SIC-codes 60-67), due to the peculiar nature of their accruals.<sup>1</sup> The sample is also restricted to firms with December fiscal year ends, which curtails the sample only insignificantly.

Curtailling the sample more severely is missing data on key variables, especially on cash flow statements, from the beginning of the sample period to about 1998. After this year Worldscope database reports cash flow statements reliably. A balance sheet approach to calculating accruals suffers from missing data on accounting variables as well. A cash flow statement approach to calculating accruals is ultimately chosen since this approach is recommended by earlier studies<sup>2</sup> and does not suffer from missing data any more severely than the balance sheet approach. The

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<sup>1</sup> Sloan (1996, 293) excludes “banks, life insurance or property and casualty companies” due to data restrictions. Researchers after Sloan, e.g. Desai, Rajgopal and Venkatachalam (2004), Baruch and Lev (2006), Kraft et al. (2007), Zhang (2007), Kaserer and Klingler (2008), Allen et al. (2013), cite the peculiar nature and measuring of accruals in these industries as reasons for excluding them from the final sample.

<sup>2</sup>Hribar and Collins (2002, 132-133) find that the presumed articulation between changes in balance sheet working capital accounts and accrued revenues and expenses on the income statement (the required presumption for balance sheet approach to measuring accruals) breaks down when non-operating events such as mergers and acquisitions, divestitures and translation of foreign subsidiary accounts are present, with implications for any research requiring the measurement of accruals.

final sample consists of 1277 firm years, of which 618 fall between years 1993-2004 (pre-IFRS) and 659 between years 2005-2013 (post-IFRS).

## 5.2 Variables

Variables employed in the empirical tests are defined and measured as follows.  $NI_t$  is defined as the year-end's net income before extraordinary items deflated by average total assets.  $CFO_t$  is defined as the year-end's net cash flow from operating activities deflated by average total assets. They are measured as follows:

$$NI_t = \frac{\text{net income before extraordinary items}}{\text{average total assets}} \quad (2)$$

$$CFO_t = \frac{\text{net cash flow from operations}}{\text{average total assets}} \quad (3)$$

Earnings figure consists of cash flows and accruals, which together make up the two components of earnings. Therefore, accruals can be defined as the difference between earnings and cash flows:

$$ACC_t = NI_t - CFO_t \quad (4)$$

Abnormal returns,  $ARE_t$ , are calculated on a security-by-security basis, as the difference between the security's annual buy-and-hold return less the corresponding return of the HEX. The annual period, during which abnormal returns are calculated, begins four months after the December fiscal year end, to ensure that the accounting information embedded on financial statements is available for market participants.

Four additional variables are used as control variables in abnormal return regression tests, in order to control for any potential omitted variable bias, as well as to account for systematic risk differences. These additional variables are the logarithm of the market value  $MV_t$ , book-to-market ratio  $BM_t$ , earnings-to-price-ratio  $EP_t$ , and the beta factor of the individual security  $BETA_t$ .  $MV_t$ ,  $BM_t$  and  $EP_t$  are measured four months after the December fiscal year end,

**Table 1**  
Mean, *Median* and (Standard Deviation) of Variables

<i>Sample period</i>	<i>1993-2013</i>	<i>pre-IFRS</i> <i>1993-2004</i>	<i>IFRS</i> <i>2005-2013</i>
<i>n (firm-year)</i>	1277	618	659
NI	0,0343967 <i>0,0490259</i> (0.1411084)	0,0361312 <i>0,054246</i> (0.1656586)	0,0327701 <i>0,0435948</i> (0.1134655)
ACC	-0,0454066 <i>-0,041791</i> (0.0916851)	-0,0492241 <i>-0,04819</i> (0.09653)	-0,0418266 <i>-0,038668</i> (0.0868178)
CFO	0,0814388 <i>0,0854828</i> (0.1271503)	0,0811174 <i>0,087655</i> (0.1448436)	0,0817402 <i>0,08301</i> (0.1080694)
ARE	-0,0164362 <i>0,0094965</i> (0.4346478)	0,0007508 <i>0,041076</i> (0.5167009)	-0,0325539 <i>-0,0010493</i> (0.3398103)
MV	5,320333 <i>5,327148</i> (1.953768)	5,163959 <i>5,2191</i> (1.920704)	5,466978 <i>5,392718</i> (1.974495)
EP	0,0779594 <i>0,0664459</i> (0.0699419)	0,0751383 <i>0,067117</i> (0.0464081)	0,0805859 <i>0,0662252</i> (0.0862316)
BM	0,6582373 <i>0,5617977</i> (0.4850699)	0,7004302 <i>0,619201</i> (0.5298359)	0,6185575 <i>0,5291153</i> (0.4355287)
BETA	0,4406303 <i>0,3733602</i> (0.3667874)	0,4098027 <i>0,314735</i> (0.3742256)	0,4695734 <i>0,4216243</i> (0.3575433)

*Notes:*

The variables are defined as follows: NI=Net income before extraordinary items deflated by average total assets; ACC=Net income before extraordinary items minus net cash flow from operating activities deflated by average total assets; CFO=Net cash flow from operations deflated by total assets; ARE=Abnormal return measured as the annual buy-and-hold stock return minus the annual return of the OMX-Helsinki market index starting four months after the fiscal year end; MV=Natural logarithm of the market value four months after the fiscal year end; EP=Earnings-to-price ratio four months after the fiscal year end; BM=Book-to-market ratio four months after the fiscal year end; BETA=250 day beta calculated with respect to the OMX-Helsinki market index over a period ending four months after fiscal year end.

whereas  $BETA_t$  is measured over a 250 day period ending four months after the fiscal year end.  $BETA_t$  for any individual security is calculated from the aforementioned 250 day period as follows:

$$\beta_s = \frac{Cov(r_s, r_{HEX})}{Var_{HEX}} \quad (5)$$

The first three of these variables are chosen for their usefulness in predicting future returns. Studies on market efficiency and abnormal returns have identified size and book-to-market ratios as anomalous factors earning high average returns (e.g. Fama and French 2008, 1653-1656; Kraft et al. 2007, 1083). Earnings-to-price-ratio, also known as earnings yield, has also been discovered to earn abnormal returns (e.g. Badrinath and Kini 2001, 385-387). Desai, Rajgopal and Venkatachalam (2004, 356-358) employ both earnings-to-price ratio and book-to-market ratio as proxies for the value-glamour anomaly<sup>3</sup>, in order to investigate whether this mispricing pattern and the accrual anomaly capture a similar phenomenon. Beta factor is included in the model to control for systematic risk differences between the securities.

### 5.3 Descriptive statistics

In the following section, descriptive statistics are provided for the sample of variables employed in the empirical tests. The mean, the median, and the standard deviation for the sample variables are reported in Table 1.

Accruals are on average negative for the whole sample period, as well as for the sub-periods (pre-IFRS and post-IFRS), which is a common finding in related empirical studies (e.g. Sloan 1996, Xie 2001, Zhang 2007). This is to be expected due to depreciation and amortization expenses, which usually make up a large proportion of accruals (Fairfield et al. 2003, 359). Abnormal returns are on average slightly negative for the whole sample period, which seems to be mainly driven by the post-IFRS sub-period. Abnormal returns for the pre-IFRS sub-period tend to zero.

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<sup>3</sup> The value-glamour anomaly refers to the empirical regularity that firms with lower past sales growth or high ratios of fundamentals-to-price (value stocks) outperform stocks with high past sales growth or relatively low fundamentals-to-price ratios (glamour stocks). The interpretations of this anomaly attribute it to overly pessimistic/optimistic investor expectations about future growth prospects or as compensation for risk implicit in value stocks. (Desai et al. 2004, 358-359.)

**Table 2**  
Correlation statistics

<i>Sample period: 1993-2013</i>								
<i>n (firm-years): 1277</i>	NI	ACC	CFO	ARE	MV	BM	EP	BETA
NI	1							
ACC	0.1512**	1						
CFO	0.5593**	-0.2279**	1					
ARE	0.2367**	0.0084	0.0775**	1				
MV	0.2256**	0.0394	0.2515**	-0.0327	1			
BM	0.0372	0.0301	0.0359	-0.0233	-0.0733**	1		
EP	0.0164	0.0123	0.0038	-0.0382	-0.0093	0.1153**	1	
BETA	-0.0966**	-0.0259	-0.0775**	-0.0394	-0.0721*	-0.0560*	-0.0590	1

  

<i>Sample period: 1993-2004 (pre-IFRS)</i>								
<i>n (firm-years): 618</i>	NI	ACC	CFO	ARE	MV	BM	EP	BETA
NI	1							
ACC	0.1726**	1						
CFO	0.5513**	-0.1676**	1					
ARE	0.2217**	-0.0215	0.0687	1				
MV	0.1886**	0.0347	0.2448**	-0.0850*	1			
BM	0.0542	0.0265	0.0787	-0.0146	-0.023	1		
EP	-0.0015	0.0534	0.0048	-0.0117	0.0888	0.067	1	
BETA	-0.0014	0.043	-0.0171	-0.0255	-0.0228	-0.1063**	-0.0615	1

  

<i>Sample period: 2005-2013 (post-IFRS)</i>								
<i>n (firm-years): 659</i>	NI	ACC	CFO	ARE	MV	BM	EP	BETA
NI	1							
ACC	0.1235**	1						
CFO	0.5757**	-0.3152**	1					
ARE	0.2671**	0.06	0.0951*	1				
MV	0.2893**	0.0384	0.2680**	0.0449	1			
BM	0.0073	0.0423	-0.0278	-0.0482	-0.1171**	1		
EP	0.0322	-0.0088	0.0012	-0.0651	-0.064	0.1655**	1	
BETA	-0.2353**	-0.1084**	-0.1606**	-0.0538	-0.1339**	0.0182	-0.0689	1

*Notes:*

The above table gives the Pearson correlation coefficients between the variables. The variables are defined as follows: NI=Net income before extraordinary items deflated by average total assets; ACC=Net income before extraordinary items minus net cash flow from operating activities deflated by average total assets; CFO=Net cash flow from operations deflated by total assets; ARE=Abnormal return measured as the annual buy-and-hold stock return minus the annual return of the OMX-Helsinki market index starting four months after the fiscal year end; MV=Natural logarithm of the market value four months after the fiscal year end; EP=Earnings-to-price ratio four months after the fiscal year end; BM=Book-to-market ratio four months after the fiscal year end; BETA=250 day beta calculated with respect to the OMX-Helsinki market index over a period ending four months after fiscal year end. \*\* indicates significance at the 0.01 level (two-tailed), \* indicates significance at the 0.05 level (two-tailed).

The negative abnormal returns for the post-IFRS sub-period may be due to the financial crisis and the sovereign debt crisis of 2007-2008 and beyond, with the following recession in economic activity. Pre-IFRS sub-period also faced recurring financial crises, but the current crisis has been particularly severe, and its effects are still lingering. This might introduce potential bias to the results of the empirical tests.

The magnitude of the four additional control variables is on average slightly greater in the post-IFRS sub-period, except for the book-to-market ratio. The magnitude of the book-to-market ratio is lower after the transition to IFRS. This is to be expected as the book values and market values should converge to some degree in the fair value accounting framework of IFRS. There are no significant changes in the other variables between the sub-periods.

#### **5.4 Correlations between variables**

The investigation of correlations between variables is intended to reveal some preliminary relationships between the variables of interest, before conducting the proper empirical tests. Table 2 reports Pearson correlation coefficients between the variables.

One-year-ahead net income before extraordinary items is significantly correlated to current accruals and cash flows. The correlation is substantially greater to cash flows than to accruals, which hints at a differing earnings persistency of the earnings components. The correlation between the current cash flow component of earnings and one-year-ahead net income is somewhat stronger in the post-IFRS sub-period, whereas the correlation between current accruals and one-year-ahead net income grows weaker in the post-IFRS sub-period.

Accruals and cash flows are significantly negatively correlated for the whole sample period, as well as for the sub-periods. This significantly negative correlation has been greater for the post-IFRS sub-period. Negative correlation between accruals and cash flows has been reported in related empirical studies on accruals and accrual anomaly (e.g. Dechow 1994, Sloan 1996, Pincus et al. 2007). Following the discussions in Dechow (1994, 19) and Dechow and Dichev (2002, 36, 53) this might be attributed to the “smoothing function” of accruals. If accruals are considered as temporary adjustments to resolve the timing problem of cash flows, it is only to be expected that these two are negatively correlated, since the magnitude of accruals is dependent on the current need to “proxy” as a cash flow. Dechow (1994,19) also points out that

the negative correlation between cash flows and accruals is also consistent with potential earnings management by accrual manipulation.

As regards the correlations of the control variables with other variables of interest, there is a statistically significant positive correlation between cash flow from operations and market value. This correlation is quite stable throughout the whole sample period, and is to be expected as well.<sup>4</sup> Some significant changes in the correlations come about in the post-IFRS sub-period, including a heightened negative correlation between BM and MV, a heightened positive correlation between BM and EP and a weakening correlation between BM and BETA.

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<sup>4</sup> VIFs (not reported) are well under 1.50 for the most highly correlated variances, which leads to the conclusion that multicollinearity is not an issue for the regression results.

## 6 Empirical analysis and results

### 6.1 Tests of H1: The Earnings Persistency of the Earnings Components

The empirical tests conducted in this thesis seek to establish whether, in the Finnish institutional setting, there exists a significant difference in the earnings persistency of current earnings components (H1), whether financial markets are efficient regarding this information (H2), and whether the introduction of IFRS has any significant effects on the results.

H1 regards the earnings persistency of current earnings components, and is formulated as a two-part hypothesis as follows:

**H1(i):** *Earnings persistency hypothesis (i):* There is no significant difference between the earnings persistency of current cash flow component of earnings and current accruals components of earnings towards one-year-ahead future earnings.

**H1(ii):** *Earnings persistency hypothesis (ii):* The introduction of IFRS has no significant effects on the earnings persistency of current cash flow component of earnings or current accruals components of earnings towards one-year-ahead future earnings.

The following empirical tests of H1 seek to establish whether the earnings persistency differs between earnings components, and whether the transition to IFRS affects the results. The correlation matrix in Table 2 already gave some indication that the earnings persistency of earnings components might differ, cash flows being more strongly correlated with one-year-ahead earnings than accruals. Tests of H1 follow the original approach by Sloan (1996, 297), where a following linear forecasting model is estimated:

$$NI_{t+1} = \alpha_0 + \alpha_1 \cdot ACC_t + \alpha_2 \cdot CFO_t + \varepsilon_{t+1} \quad (6)$$

One-year-ahead earnings are regressed on current earnings components in order to form estimates of the “objective” persistency of the earnings components. These are referred to as objective forecasting coefficients. Later, tests of H2 investigate whether financial markets assign regression coefficients for the earnings components in accordance with their objective

**Table 3**  
 Ordinary Least Squares Regression of One-Year Ahead Earnings on Current Accruals and Cash  
 Flows from operations (standard errors in parentheses)

	$NI_{t+1} = \alpha_0 + \alpha_1 \cdot ACC_t + \alpha_2 \cdot CFO_t + \varepsilon_{t+1}$	
	$NI_{t+1} = \alpha_0 + \beta_0 IFRS + (\alpha_1 + \beta_1 IFRS) \cdot ACC_t + (\alpha_2 + \beta_2 IFRS) \cdot CFO_t + \varepsilon_{t+1}$	
	<i>Not controlling for IFRS</i>	<i>Controlling for IFRS</i>
<i>Sample period</i>	<i>1993-2013</i>	<i>1993-2013</i>
<i>n (firm-years)</i>	<i>1277</i>	<i>1277</i>
$\alpha_0$	-0,002 0,004	0,004 0,005
$\beta_0$		-0,011 0,008
$\alpha_1$	0,452 ** 0,034	0,468 ** 0,046
$\beta_1$		-0,025 0,070
$\alpha_2$	0,695 ** 0,025	0,683 ** 0,031
$\beta_2$		0,034 0,052
$R^2$	0,395	0,396
Adj. $R^2$	0,394	0,393
$\alpha_1 = \alpha_2$	rejection**	rejection**
$\alpha_1 + \beta_1 = \alpha_2 + \beta_2$		rejection**
$\alpha_1 = \alpha_1 + \beta_1$		no rejection
$\alpha_2 = \alpha_2 + \beta_2$		no rejection

*Notes:*

The variables are defined as follows: NI=Net income before extraordinary items deflated by average total assets; ACC=Net income before extraordinary items minus net cash flow from operating activities deflated by average total assets; CFO=Net cash flow from operations deflated by total assets; MV=Natural logarithm of the market value four months after the fiscal year end; EP=Earnings-to-price ratio four months after the fiscal year end; BM=Book-to-market ratio four months after the fiscal year end; BETA=250 day beta calculated with respect to the OMX-Helsinki market index over a period ending four months after fiscal year end; IFRS=dummy variable equal to 0 for firm years 1993-2004 and equal to 1 for firm years 2005-2013. \*\* indicates significance at the 0.01 level (two-tailed), \* indicates significance at the 0.05 level (two-tailed).  $\alpha_1 = \alpha_2$ ,  $\alpha_1 + \beta_1 = \alpha_2 + \beta_2$ ,  $\alpha_1 = \alpha_1 + \beta_1$ ,  $\alpha_2 = \alpha_2 + \beta_2$  are tested by a Wald test statistic.

forecasting coefficients. That is, whether the financial markets are efficient in regard to the information embedded in current earnings components.

In order to study the potential effects that the transition from national accounting standards to IFRS has on the persistency of earnings components, a dummy variable “IFRS” is introduced to the model:

$$NI_{t+1} = \alpha_0 + \beta_0 IFRS + \alpha_1 ACC_t + \beta_1 IFRS \cdot ACC_t + \alpha_2 CFO_t + \beta_2 IFRS \cdot CFO_t + \varepsilon_{t+1} \quad (7)$$

Interaction terms  $IFRS \cdot ACC_t$  and  $IFRS \cdot CFO_t$  are estimates for the marginal effect that the transition to IFRS has on the coefficients for the earnings components. The above model can be rewritten as:

$$NI_{t+1} = \alpha_0 + \beta_0 IFRS + (\alpha_1 + \beta_1 IFRS) \cdot ACC_t + (\alpha_2 + \beta_2 IFRS) \cdot CFO_t + \varepsilon_{t+1} \quad (8)$$

The dummy variable IFRS equals 1 for the financial statements published in 2005 and after, and zero for the financial statements of the preceding time period. Controlling for the transition to IFRS allows us to discern between pre-IFRS and post-IFRS sub-periods. After estimating the model, a Wald test<sup>5</sup> is applied to the coefficients for the earnings components to test their equality. Rejection of equality indicates differing earnings persistency between the earnings components.

Results of the empirical tests on the earnings persistency of earnings components are reported in Table 3. Adjusted R<sup>2</sup>s for the models are moderately high, with current earnings components explaining about 40% of the variation in one-year-ahead earnings. In keeping with previous research on the persistency of earnings components, cash flows are estimated to be significantly more persistent than accruals for the whole sample period ( $\alpha_1=0.452 < \alpha_2=0.695$ ). Controlling for the transition to IFRS changes the results only insignificantly ( $\alpha_1=0.468 < \alpha_2=0.683$ ). Wald tests reject the equality of estimated coefficients for the earnings components for the whole sample period, as well as for the sub-periods at the 0.01 significance level. The coefficients for

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<sup>5</sup> A Wald test is the standard test in Stata by which to test hypotheses about the parameters of fit models.

the earnings components are significant at the 0.01 level in both models, while the coefficients for the interaction terms measuring the marginal effects of the transition to IFRS are insignificant. Wald tests reject any differences between the pre-IFRS and post-IFRS sub-period earnings persistency of earnings components ( $\alpha_1 = \alpha_1 + \beta_1$  and  $\alpha_2 = \alpha_2 + \beta_2$ ).

H1(i) is thus rejected, as it states that there is no significant difference between the earnings persistency of earnings components. The earnings persistency of the cash flow component of earnings is estimated to be significantly higher. H1(ii) is not rejected, since the introduction of IFRS has no significant effects on the differing earnings persistency of accruals and cash flow components of earnings. The introduction of the IFRS dummy to the model does not result in either equalizing or reversing the earnings persistency of the earnings components.

As a conclusion on the tests of earnings persistency, the cash flow component of earnings is estimated to be significantly more persistent than the accrual component. The transition to IFRS does not change these results. The next set of empirical tests investigates whether the financial markets are efficient in regard to this information embedded in the earnings components.

## **6.2 Tests of H2: Tests of market efficiency**

### **6.2.1 Regression model excluding control variables**

Tests of H1 established the objective forecasting coefficients for the current earnings components, with the results indicating the earnings persistency of cash flows to be greater than the earnings persistency of accruals. The following tests of H2 investigate whether financial markets assign regression coefficients for the earnings components in accordance with their objective forecasting coefficients. In other words, tests of H2 seek to establish whether the financial markets are efficient in regard to the information towards future earnings implicit in the current earnings components. The market regression coefficients should converge with the objective forecasting coefficients, reflecting the greater earnings persistency of cash flows and the weaker earnings persistency of accruals. Otherwise, market efficiency is rejected.

The hypothesis for H2 is formulated as a two-part hypothesis:

**H2(i):** *Accrual anomaly hypothesis (i):* Financial markets treat earnings persistency of the current earnings components in accordance with their objective forecasting coefficients.

**H2(ii):** *Accrual anomaly hypothesis (ii):* The introduction of IFRS has no significant effects on financial markets estimating current earnings components in accordance with their objective forecasting coefficients.

The tests of market efficiency in regard to accounting information are usually carried out by a Mishkin-test or a linear regression model. Sloan (1996) applied the Mishkin-test in his original study on the accrual anomaly, and it has been applied in much of the following research since. The use of the Mishkin-test in accounting related study settings has however faced criticism in recent literature. Kothari, Sabino and Zach (2005, 147-152) report Mishkin-tests to be especially sensitive to data truncation due to non-survival and sample size. Kraft et al. demonstrate that omission of variables from the forecasting and pricing equations of the Mishkin-test bias the results to an extent not taken into account by the previous accounting literature. Only if the omitted variables are rationally priced themselves, their omission from the model does not affect the inferences drawn from the model. Adding explanatory variables to the model leads to the vanishing of the accrual anomaly. (Kraft et al. 2007, 1081-1088; 1096-1108.)

These results lead Kraft et al. to recommend a linear regression approach to study the efficient pricing of accounting information, since adding explanatory variables to a linear regression model is straightforward. A linear regression model is also easier to implement and generally better understood, as well as making comparisons across accounting studies more applicable. In contrast to a linear regression model, Mishkin-test is an iterative estimation procedure where researchers set their own convergence criteria, which is rarely reported. Also, popular statistical packages usually lack a specific procedure to implement the Mishkin-test. (Kraft et al. 2007, 1111-1113.)

Kraft et al. demonstrate a linear regression model to be theoretically asymptotically equal to a Mishkin-test, as well as practically producing virtually identical inferences about rational pricing (Kraft et al. 2007, 1089-1091; 1108-1111). The following demonstration of the theoretical equivalence between the models is adapted from Kraft et al. (2007, 1089-1091):

The Mishkin-test consists of estimating the following system of equations by nonlinear generalized least squares estimation method:

$$NI_{t+1} = \alpha_0 + \alpha_1 \cdot ACC_t + \alpha_2 \cdot CFO_t + \varepsilon_{t+1} \quad (9)$$

$$ARE_{t+1} = \beta(NI_{t+1} - \alpha_0^* - \alpha_1^*ACC_t - \alpha_2^*CFO_t) + \varepsilon_{t+1} \quad (10)$$

$\alpha_1$  and  $\alpha_2$  stand for the objective forecasting coefficients of the earnings components, whereas  $\alpha_1^*$  and  $\alpha_2^*$  represent market coefficients. It would then be tested whether  $\alpha_1 = \alpha_1^*$  or  $\alpha_2 = \alpha_2^*$ . Rejection of this equality would indicate that market prices over- or underweigh the earnings persistency of the current earnings components. Note that the forecasting and pricing equations contain only the current earnings components as explanatory variables.

However, by substituting  $NI_{t+1}$  in the second equation with the first equation, the resulting model we have would look like the following:

$$ARE_{t+1} = \beta(\alpha_0 + \alpha_1 ACC_t + \alpha_2 CFO_t + v_{t+1} - \alpha_0^* - \alpha_1^*ACC_t - \alpha_2^*CFO_t) + \varepsilon_{t+1} \quad (11)$$

Collecting the terms, we have:

$$ARE_{t+1} = \beta(\alpha_0 - \alpha_0^*) + \beta(\alpha_1 - \alpha_1^*)ACC_t + \beta(\alpha_2 - \alpha_2^*)CFO_t + \beta v_{t+1} + \varepsilon_{t+1} \quad (12)$$

This equation can be written as:

$$ARE_{t+1} = \theta_0 + \theta_1 \cdot ACC_t + \theta_2 \cdot CFO_t + \theta_3 v_{t+1} + u_t \quad (13)$$

where  $\theta_i = \beta(\alpha_i - \alpha_i^*)$ .

**Table 4**  
 Ordinary Least Squares Regression of Abnormal returns on Current Accruals and Cash  
 Flows from operations (standard errors in parentheses)

$$ARE_{t+1} = \alpha_0 + \alpha_1 \cdot ACC_t + \alpha_2 \cdot CFO_t + \varepsilon_{t+1}$$

$$ARE_{t+1} = \alpha_0 + \beta_0 IFRS + (\alpha_1 + \beta_1 IFRS) \cdot ACC_t + (\alpha_2 + \beta_2 IFRS) \cdot CFO_t + \varepsilon_{t+1}$$

<i>Sample period</i>	<i>Not controlling for IFRS</i>		<i>Controlling for IFRS</i>	
<i>n (firm-years)</i>	<i>1993-2013</i>		<i>1993-2013</i>	
	<i>939</i>		<i>939</i>	
$\alpha_0$	0.005		0.004	
	0.018		0.024	
$\beta_0$			-0.023	
			0.040	
$\alpha_1$	-0.393	*	-0.894	**
	0.203		0.289	
$\beta_1$			1.075	**
			0.423	
$\alpha_2$	-0.075		-0.168	
	0.139		0.159	
$\beta_2$			0.386	
			0.326	
$R^2$	0.004		0.012	
Adj. $R^2$	0.002		0.006	
$\alpha_1 + \beta_1 = 0$			no rejection	
$\alpha_2 + \beta_2 = 0$			no rejection	

*Notes:*

The variables are defined as follows: NI=Net income before extraordinary items deflated by average total assets; ACC=Net income before extraordinary items minus net cash flow from operating activities deflated by average total assets; CFO=Net cash flow from operations deflated by total assets; ARE=Abnormal return measured as the annual buy-and-hold stock return minus the annual return of the OMX-Helsinki market index starting four months after the fiscal year end; MV=Natural logarithm of the market value four months after the fiscal year end; EP=Earnings-to-price ratio four months after the fiscal year end; BM=Book-to-market ratio four months after the fiscal year end; BETA=250 day beta calculated with respect to the OMX-Helsinki market index over a period ending four months after fiscal year end; IFRS=dummy variable equal to 0 for firm years 1993-2004 and equal to 1 for firm years 2005-2013. \*\* indicates significance at the 0.01 level (two-tailed), \* indicates significance at the 0.05 level (two-tailed).  $\alpha_1 + \beta_1 = 0$  and  $\alpha_2 + \beta_2 = 0$  are tested by a Wald test statistic.

Equation (13) can be estimated as a linear regression model, where the sign of the coefficient  $\theta_i$  indicates the potential over- or underweighting by the financial markets. If  $\theta_i$  is positive, this indicates underweighting (forecasting coefficient  $\alpha_i >$  market coefficient  $\alpha_i^*$ ); if  $\theta_i$  is negative, this indicates overweighting (objective coefficient  $\alpha_i <$  market coefficient  $\alpha_i^*$ ). This rearranging of the Mishkin-test into a linear regression model is applied to conduct tests of H2.

Abnormal return regression tests begin with models that include only  $ARE_{t+1}$ ,  $ACC_t$ ,  $CFO_t$ , and the dummy variable IFRS. The four additional control variables are omitted at this point. The following linear regression models are estimated:

$$ARE_{t+1} = \alpha_0 + \alpha_1 \cdot ACC_t + \alpha_2 \cdot CFO_t + \varepsilon_{t+1} \quad (14)$$

Controlling for the transition to IFRS with the dummy variable:

$$ARE_{t+1} = \alpha_0 + \beta_0 IFRS + \alpha_1 ACC_t + \beta_1 IFRS \cdot ACC_t + \alpha_2 CFO_t + \beta_2 IFRS \cdot CFO_t + \varepsilon_{t+1} \quad (15)$$

Which can be rewritten as:

$$ARE_{t+1} = \alpha_0 + \beta_0 IFRS + (\alpha_1 + \beta_1 IFRS) \cdot ACC_t + (\alpha_2 + \beta_2 IFRS) \cdot CFO_t + \varepsilon_{t+1} \quad (16)$$

After estimating this latter model, a Wald test is applied to the post-IFRS coefficients for the earnings components ( $\alpha_1 + \beta_1 IFRS$  and  $\alpha_2 + \beta_2 IFRS$ ) to test whether they differ significantly from zero.

Table 4 reports the results of the linear regression tests. The results from the whole sample period, not controlling for the transition to IFRS, show accruals to be overweighed as the coefficient for accruals is substantially negative ( $\alpha_1 = -0.393$ ) and statistically significant. The overweighing seems to be driven by the pre-IFRS sub-period, since controlling for IFRS further strengthens the overweighing ( $\alpha_1 = -0.894$  for the pre-IFRS sub-period). At the same time a Wald test of the coefficients for the post-IFRS sub-period ( $\alpha_1 + \beta_1 = 0$ ) is not rejected. The coefficient of accruals for the post-IFRS sub-period does not differ significantly from zero. Overweighing of accruals therefore manifests itself only in the pre-IFRS sub-period, and vanishes in the post-IFRS sub-period.

Rational pricing of cash flows is not rejected, whether controlling for IFRS or not. The coefficient for cash flows ( $\alpha_2$ ) is not statistically significant for the whole sample period, neither for the pre-IFRS sub-period, and a Wald test of the coefficients for the post-IFRS sub-period ( $\alpha_2 + \beta_2 = 0$ ) is not rejected.

H2 would thus be rejected as regards the accruals component of earnings, since the accrual component is outweighed relative to its objective earnings persistency (H2(i)), and this outweighing vanishes by the introduction of IFRS (H2(ii)). It should also be noted that the adjusted R<sup>2</sup>s for the regression models are very low, even for an abnormal returns model (0.002 and 0.012). This suggests that including only the variables ACC<sub>t</sub>, CFO<sub>t</sub>, and the dummy variable IFRS in the model does not have much explanatory power as regards the variation in one-year-ahead abnormal returns.

### 6.2.2 Regression model including control variables

The next set of empirical tests test whether the previous results survive the addition of control variables to the regression model, and whether the explanatory power of the model is enhanced. The four additional control variables (EP, BM, MV and BETA) are now introduced to the linear regression model. The resulting model will be referred to as the “complete regression model”. As was discussed above, earlier research has shown EP, BM and MV to predict abnormal returns. Omitting them from the regression model might lead to omitted variable bias. BETA controls for the systematic risk differences between the securities, so that the reward for risk in the abnormal returns can be controlled for. The regression model with additional variables is estimated with and without controlling for the IFRS:

$$\begin{aligned} \text{ARE}_{t+1} = & \alpha_0 + \alpha_1 \cdot \text{ACC}_t + \alpha_2 \cdot \text{CFO}_t + \alpha_3 \text{ EP} + \alpha_4 \text{ BM} + \alpha_5 \text{ MV} \\ & + \alpha_6 \text{ BETA} + \varepsilon_{t+1} \end{aligned} \quad (17)$$

Controlling for the transition to IFRS:

$$\begin{aligned} \text{ARE}_{t+1} = & \alpha_0 + \beta_0 \text{ IFRS} + \alpha_1 \text{ ACC}_t + \beta_1 \text{ IFRS} \cdot \text{ACC}_t + \alpha_2 \text{ CFO}_t + \beta_2 \text{ IFRS} \\ & \cdot \text{CFO}_t + \alpha_3 \text{ EP} + \alpha_4 \text{ BM} + \alpha_5 \text{ MV} + \alpha_6 \text{ BETA} + \varepsilon_{t+1} \end{aligned} \quad (18)$$

This is rewritten as:

$$\begin{aligned} \text{ARE}_{t+1} = & \alpha_0 + \beta_0 \text{ IFRS} + (\alpha_1 + \beta_1 \text{ IFRS}) \cdot \text{ACC}_t + (\alpha_2 + \beta_2 \text{ IFRS}) \\ & \cdot \text{CFO}_t + \alpha_3 \text{ EP} + \alpha_4 \text{ BM} + \alpha_5 \text{ MV} + \alpha_6 \text{ BETA} + \varepsilon_{t+1} \end{aligned} \quad (19)$$

**Table 5**  
 Ordinary Least Squares Regression of Abnormal returns on Current Accruals and Cash  
 Flows from operations with control variables (standard errors in parentheses)

$$ARE_{t+1} = \alpha_0 + \alpha_1 \cdot ACC_t + \alpha_2 \cdot CFO_t + \alpha_3 EP + \alpha_4 BM + \alpha_5 MV + \alpha_6 BETA + \varepsilon_{t+1}$$

$$ARE_{t+1} = \alpha_0 + \beta_0 IFRS + (\alpha_1 + \beta_1 IFRS) \cdot ACC_t + (\alpha_2 + \beta_2 IFRS) \cdot CFO_t + \alpha_3 EP + \alpha_4 BM + \alpha_5 MV + \alpha_6 BETA + \varepsilon_{t+1}$$

Sample period <i>n</i> (firm-years)	Not controlling for IFRS 1993-2013 939		Controlling for IFRS 1993-2013 939	
	$\alpha_0$	-0,192 0,051	**	-0,255 0,056
$\beta_0$			0,109 0,043	*
$\alpha_1$	-0,203 0,194		-0,583 0,278	*
$\beta_1$			0,616 0,428	
$\alpha_2$	0,291 0,140	*	0,260 0,171	
$\beta_2$			0,034 0,351	
$\alpha_3$	0,742 0,187	**	0,767 0,211	**
$\alpha_4$	0,182 0,032	**	0,188 0,033	**
$\alpha_5$	0,019 0,008	*	0,023 0,008	**
$\alpha_6$	-0,252 0,040	**	-0,307 0,043	**
$R^2$	0,112		0,126	
Adj. $R^2$	0,106		0,118	
$\alpha_1 + \beta_1 = 0$			no rejection	
$\alpha_2 + \beta_2 = 0$			no rejection	

*Notes:*

The variables are defined as follows: NI=Net income before extraordinary items deflated by average total assets; ACC=Net income before extraordinary items minus net cash flow from operating activities deflated by average total assets; CFO=Net cash flow from operations deflated by total assets; ARE=Abnormal return measured as the annual buy-and-hold stock return minus the annual return of the OMX-Helsinki market index starting four months after the fiscal year end; MV=Natural logarithm of the market value four months after the fiscal year end; EP=Earnings-to-price ratio four months after the fiscal year end; BM=Book-to-market ratio four months after the fiscal year end; BETA=250 day beta calculated with respect to the OMX-Helsinki market index over a period ending four months after fiscal year end; IFRS=dummy variable equal to 0 for firm years 1993-2004 and equal to 1 for firm years 2005-2013. \*\* indicates significance at the 0.01 level (two-tailed), \* indicates significance at the 0.05 level (two-tailed).  $\alpha_1 + \beta_1 = 0$  and  $\alpha_2 + \beta_2 = 0$  are tested by a Wald test statistic.

Table 5 reports the results of estimating the regression model with the additional control variables. For the whole sample period, the inclusion of additional control variables results in the loss of statistical significance for the accruals coefficient. However, when controlling for IFRS, overweighing of the accrual component recurs. The results again indicate the overweighing of accruals to be driven by the pre-IFRS sub-period, since the accrual coefficient  $\alpha_1$  becomes statistically significant and substantially negative ( $\alpha_1 = -0.583$ ) when controlling for the transition to IFRS. Introducing the additional control variables to the model weakens the overweighing of accruals for the pre-IFRS sub-period, suggesting the previous regression model to have suffered from omitted variable bias. It should also be noted that the significance level for the accruals coefficient drops to 0.05, whereas it was significant at the 0.01 level in the model excluding the control variables. Overweighing once again vanishes for the post-IFRS sub-period, as the Wald test of the coefficients ( $\alpha_1 + \beta_1 = 0$ ) is not rejected.

Interestingly, the results indicate underweighting of the cash flow component ( $\alpha_2 = 0.291$ ) for the whole sample period. Underweighting of the cash flow component disappears once the introduction of IFRS is controlled for. This would indicate the underweighting to be driven by the post-IFRS sub-period, as the coefficient for  $\alpha_2$  fades into statistical insignificance once IFRS is controlled for. However, the Wald test for  $\alpha_2 + \beta_2 = 0$  is not rejected, indicating there to be no underweighting of the cash flow component for the post-IFRS sub-period. This is to some extent an anomalous result since if underweighting of cash flows were to be driven by the post-IFRS sub-period, one would expect the Wald test for  $\alpha_2 + \beta_2 = 0$  to be rejected. This however is not the case, and one has to conclude that the underweighting is not ultimately significant at the chosen significance levels. The underweighting of the cash flow component for the whole sample period is ultimately an anomalous result. Rational pricing of cash flows is thus not ultimately rejected.

The four additional control variables are all found to be statistically significant, which also suggests that the previous model suffered from omitted variable bias. The coefficient for EP, or earnings yield, is substantially positive. This supports the occurrence of the earnings yield anomaly. The coefficient for BM is also positive. Together with the substantially positive coefficient for EP, this supports the value-glamour anomaly briefly discussed in chapter five (footnote 2). The coefficient for MV is statistically significant, but nevertheless of insignificant magnitude. This would indicate the absence or insignificance of the size-anomaly. BETA, the

proxy for systematic risk differences, is significantly negative. Riskiness may be interpreted as negatively connected with abnormal returns.

The addition of the four control variables to the model also raises adjusted  $R^2$ s significantly to a level commonly reached in abnormal returns studies. This indicates their joint significance in predicting future abnormal returns, and further strengthening the evidence for omitted variable bias resulting from their exclusion from the model.

In conclusion, the overweighting of the accrual component survives the addition of the control variables to the model. H2 is rejected as regards the accrual component of earnings. The accrual component is overweighed relative to its objective earnings persistency (i), and this overweighting vanishes by the introduction of IFRS (ii). Introducing the additional control variables to the model weakens the overweighting of accruals for the pre-IFRS sub-period, suggesting the previous regression model to have suffered from omitted variable bias. The control variables are all statistically significant, with most substantial coefficients in magnitude assigned for earnings-to-price-ratio, book-to-market-ratio and the beta factor.

### **6.2.3 Controlling for the “year effects”**

Yearly variation in abnormal returns might be positively connected with some unobserved factors not captured by the complete regression model above. This variation is referred to as “year effects”. Not controlling for this yearly variation due to unobserved factors might bias the results. The inclusion of “year dummies” to the model controls for the aggregate effect of unobserved factors that affect the abnormal returns in general. For each year of abnormal returns, except for the first year, a year dummy is included to the model.

The inclusion of year dummies to the model does not greatly affect the magnitude of the coefficient for the accrual component, nor reduce its statistical significance. The accrual component appears to be overweighed in the pre-IFRS sub-period even with controlling for the year effects. Year dummies themselves have negative coefficients and are statistically significant, except for one year.

In short, controlling for the year effects with the inclusion of year dummies to the complete regression model does not affect the results as regards the accrual component of earnings.

#### **6.2.4 Robustness tests for outliers**

Cursory examination of the data reveals the presence of a number of outliers in the data variables. The biasing effects of extreme outliers on the OLS-regressions are well known. Less agreed on is whether the effects of outliers in returns-based financial market studies should be worried about or tinkered with (Richardson, Tuna and Wysocki 2010, 429; Kothari et al. 2005, 131-132). Regardless of this question, robustness tests for outliers are carried out in order to investigate the potential effects of outliers to the regression results.

There are several techniques of dealing with outliers in order to obtain robust regression estimators. The robustness tests applied here involve the winsorizing of the variables. Winsorizing limits the values of extreme outliers in order to reduce their significance in an ordinary least squares regression estimation. The variables are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles to reduce the effects of extreme outliers. Following Kraft et al. (2007, 1092), the robustness tests are conducted by both winsorizing all of the variables, as well as by excluding abnormal returns from the winsorizing process.

Winsorizing all of the variables, as well as excluding abnormal returns from the winsorizing process, produces parallel results. The overweighting of the accrual component of earnings for the pre-IFRS sub-period loses its statistical significance. Running the robust regressions with the inclusion of year dummies does not affect the results in any significant way.

## 7 Summary and conclusions

Every business enterprise faces a similar problem in measuring its performance: performance needs to be measured for a discrete time period, yet cash flows generated by the operations do not necessarily match this time period. This timing problem is solved by the use of accruals, which can be thought of as a proxy for the “misdated” cash flows. Accordingly, Dechow and Dichev (2002, 53) define accruals as “...*temporary adjustments that resolve timing problems in the underlying cash flows...*” In addition to this performance measurement perspective to accruals, Zhang (2007, 1336-1337) argues accrual accounting to mitigate the noise in cash flows introduced by variations in working capital assets and liabilities. This incorporates a long-term investment perspective to accruals in addition to the short-term measurement perspective.

The usage of accruals in measuring performance introduces a certain trade-off in the revenue recognition process. Accruals always represent best estimations, and as such, are bound to include errors. Also, earnings management is commonly carried out by accrual manipulation. Unintentional misestimation and intentional manipulation of accruals introduces errors into the accruals process, which lower the earnings quality. Current earnings predict future earnings less well due to accrual errors. Another view on accruals explains the lower earnings persistency of accruals by diminishing marginal returns to new investment. The cash flow component of earnings is less prone to errors or earnings management. The ability of the current earnings components to predict future earnings thus tends to differ. The efficient market hypothesis states that security prices should more or less reflect all publicly available information. Security prices should thus reflect also the information relating to the earnings persistency of the earnings components. To the extent they do not, this constitutes a market inefficiency.

A clear gap was identified in the existing research on accrual anomaly concerning the effects of accounting standards on the anomaly. This thesis does its part to fill this gap. The few existing international studies offer some evidence on the relationship between accounting standards and accrual anomaly. Specifically, common law accounting standards have been found to be connected with the accrual anomaly. It is however difficult to entangle the effects of accounting standards from the complexities that every institutional setting presents. Ideally, to entangle the effects that accounting standards have on the accrual anomaly, one would need to construct a *ceteris paribus* experiment where all other factors excluding the accounting standards stay constant. The closest

approximation to this ideal experimental setting as is available to a researcher is to investigate a transition from one accounting standard to another in a single institutional setting. IFRS became mandatory in Finland from fiscal year 2005 onwards, offering just this opportunity to study the effects that a change in accounting standards has on accrual anomaly. This transition represents a transition from a conservative code law accounting standard to the fair value accounting framework of IFRS.

To the best knowledge of the author of this thesis, there exists only one published study investigating the effects of a change in accounting standards to the accrual anomaly. Kaserer and Klingler (2008) study the effects on accrual anomaly of the voluntary transition to international accounting standards (IFRS/US-GAAP) in Germany during the years 1995-2002. They present evidence that market overreaction to accrual information is a phenomenon primarily related to accounting information prepared under the fair valuation framework of international accounting standards. The introduction of fair value accounting framework therefore introduced accrual anomaly in the German institutional setting. Kaserer and Klingler qualify their results by presuming that the effects of adopting a particular accounting framework depend on the corporate governance system under which the accounting framework is implemented. Under weak corporate governance systems fair value accounting might result in more extensive accrual manipulation. Due to a lack of empirical evidence, they leave open to future research the question of the effect on accrual anomaly of introducing fair value accounting standards under a stronger corporate governance regime. Based on existing comparative research, the corporate governance regime in Finland may be characterized as semi-strong. The thesis investigates the effects on accrual anomaly of a transition to fair value accounting framework under a semi-strong corporate governance regime. In addition to this main contribution, the thesis presents empirical results regarding the occurrence of accrual anomaly outside of the U.S. context, which is lacking in its current extent.

The sample used in the empirical tests consists of 1277 firm years over 1993-2013, of which 618 fall between years 1993-2004 (pre-IFRS) and 659 between years 2005-2013 (post-IFRS). The first hypothesis concerns the earnings persistency of current earnings components towards one-year-ahead future earnings. Results of the empirical tests show that the cash flow component of earnings is significantly more persistent than the accrual component, which is in accordance with previous empirical research on accruals and accrual anomaly. The transition to IFRS does not have significant effects on the earnings persistency of the earnings components. This latter finding is contrary to

Kaserer and Klingler (2008), who found that differences in earnings persistency came about over the period of voluntary switching to international accounting standards.

The second hypothesis concerns the efficiency of the financial markets as regards the information on earnings persistency embedded in the current earnings components. The second set of empirical tests investigate whether stock prices correctly reflect the implications of current earnings components for future annual earnings, and whether the introduction of IFRS has any effects on this. The preliminary results indicate overweighting of the accrual component in the pre-IFRS sub-period under the domestic accounting standards. Overweighing of accruals vanishes by the introduction of IFRS-standards.

Kraft et al. (2007) have criticized previous research on accrual anomaly for not taking into account the potential omitted variable bias resulting from the commonly applied research method. Much of the research on accrual anomaly has been conducted by a Mishkin-test, including only the current earnings components as explanatory variables for the variance of future abnormal returns. Kraft et al. (2007) argue that this might lead to omitted variable bias in the results. To account for this, additional control variables are included in the model: earnings-to-price ratio, book-to-market ratio, logarithm of the market value and the beta factor for each of the individual securities. The first three of these variables have been shown by previous research to earn abnormal returns. The beta factor is included to control for systematic risk differences between the variables.

The question of interest then becomes whether the results indicating overweighting of accruals survive the addition of these control variables to the model. The answer to this is affirmative. Accrual overweighting weakens by the inclusion of additional control variables, but remains substantial and statistically significant for the pre-IFRS sub-period. The overweighting once again vanishes in the post-IFRS sub-period. The control variables shown by earlier research to earn abnormal returns are attributed statistically significant coefficients in the abnormal return regression tests. The coefficient of determination also rises to levels common in abnormal return studies. Therefore, it is most probable that the earlier model suffered from omitted variable bias. These results support the assertion made by Kraft et al. (2007) on the potential omitted variable problem of previous accrual anomaly studies.

Finally, there has been some criticism on the lack of robustness testing in accrual anomaly related research. Kraft et al. (2006, 299) list several of the most influential accrual anomaly related studies, including the originating study by Sloan (1996), as not assessing the sensitivity of their results to

extreme abnormal return observations. Excluding a small number of extreme firm-year observations reveals an inverted U-shaped relation between abnormal returns and total accruals, instead of a steadily ascending relation. The same extreme firm-year observations driving the total accrual anomaly of Sloan (1996) are reported to explain also the abnormal accrual and growth-related approaches. (Kraft et al. 2006, 332.)

Richardson et al. (2010, 429) hold this inference of the accrual anomaly as being sensitive to outliers as incorrect, since they hold all return realizations other than data errors as valid observations. The average return of an entire portfolio may be influenced substantially by extreme returns, which cannot be considered invalid since they are nevertheless truly realized returns to the portfolio (Richardson et al. 2010, 429). Kraft et al. (2006, 299) do recognize this, and hold it to be the correct position when testing the profitability of a trading strategy. However, when researchers test a theory on a particular hypothesized cause of an anomaly, conventional robustness tests of the results should be conducted, since the hypothesized cause-and-effect relation should not be driven by only a small number of observations (Kraft et al. 2006, 299-300). On the other hand, Kothari et al. (2005, 131-133) report that active trimming of the data by researchers contributes to a bias in favor of finding systematic mispricing in tests of market efficiency.

Regardless of the fact that most of the preceding research on accrual anomaly has omitted robustness testing, the effects of outliers to the results are investigated. The variables are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles. The results are reported by winsorizing all of the variables as well as by excluding abnormal returns from the winsorizing process. The results of both winsorizing methods produce similar results. The overweighting of the accrual component of earnings loses its statistical significance. The results after robustness testing indicate no biases in the weighting of the earnings components by the financial markets.

There are two ways of interpreting these conflicting results. If one is ready to assume all data points as valid, as apparently most of the research on accrual anomaly does, then one is inclined to accept the results indicating overweighting of the accrual component of earnings for the pre-IFRS sub-period. These results, which are reached without trimming or truncating the data, are then comparable to much of the research on accrual anomaly, which mostly omits these procedures. The results would indicate that accrual anomaly is negatively connected to fair value accounting standards under a semi-strong corporate governance regime. On the other hand, if the criticism of Kraft et al. (2006) on the need for conventional robustness testing of the results is held to be valid, one is inclined to reject the

results indicating overweighting of the accrual component and instead affirm market efficiency for the whole time period under study. In this case this thesis does not present any new evidence on accrual anomaly, except that Finland is still another code law institutional setting without the occurrence of accrual anomaly.

In addition to robustness testing, the conclusions drawn from the empirical results depend on the way we choose to characterize the Finnish corporate governance regime. Assuming the validity of the empirical results indicating accrual overweighting in the pre-IFRS sub-period, the results are the reverse of those by Kaserer and Klingler (2008), which indicated accrual overweighting only for the post-IFRS sub-period. If one were to characterize the Finnish corporate governance regime as semi-strong, these contrary results might be reconciled to some extent. This reconciliation might note that the introduction of IFRS results in higher quality financial statements under a stronger corporate governance regime, whereas contrary results emerge under a weak corporate governance regime. Evaluating the relative strength of the Finnish corporate governance regime with precision is however not possible. Therefore we cannot straightforwardly draw the conclusion that the adoption of true and fair value accounting standards results in more accurate information under a stronger corporate governance regime, but conclusions are left somewhat ambiguous in this regard.

At the least it can be stated that the results of the empirical tests are contrary to establishing a positive connection between accrual anomaly and fair value accounting standards. Future research might extend the investigation of the connection between accrual anomaly and accounting standards further, by extending the empirical research data to cover the whole extent of the European Union, where the transition to IFRS has been carried out during the last decade. A more extensive research of this kind would help to establish more conclusively if there exists any connection between accrual anomaly and accounting standards.

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