

Philipp Moser

# The Development of Earnings Quality of International Financial Reporting Standards (IFRS) over Time

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Prof. Dr. Ralf Ewert  
Department of Accounting and Auditing

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## Author's Declaration

Unless otherwise indicated in the text or references, or acknowledged above, this thesis is entirely the product of my own scholarly work. Any inaccuracies of fact or faults in reasoning are my own and accordingly I take full responsibility. This thesis has not been submitted either in whole or part, for a degree at this or any other university or institution. This is to certify that the printed version is equivalent to the submitted electronic one.

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## Abbreviations

ACC	Accruals
AUD	Dummy Variable for Auditor
$B_t$	Book Value of Equity in Period $t$
$BVE_t$	Book Value of Equity
Cf.	Compare with (latin: confer)
CFO	Cash Flow
CSR	Clean Surplus Relation
DACC	Discretionary Accruals
DDM	Dividend Discount Model
Dissue	Percentage Change in Total Liabilities
DR	Dummy Variable
$d_t$	Net Dividend in Period $t$
$E_t$	Expectation Conditional in Period $t$
EBIT	Earnings before Interest and Tax
EBITA	Earnings before Interest, Tax, and Amortization
EBITDA	Earnings before Interest, Tax, Depreciation, and Amortization
Eissue	Percentage Change in Common Shareholder's Equity
EU	European Union
$Exp_t$	Expenses
FASB	Financial Accounting Standards Board
FF	Free Float
GAAP	Generally Accepted Accounting Principles
GROWTH	Percentage of Changes in Sales
IAS	International Accounting Standard
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
i.e.	in other words
IFRIC	International Financial Reporting Interpretation Committee
IFRS	International Financial Reporting Standard
IPO	Initial Public Offering
LEV	Total Liabilities Divided by Shareholders' Equity
LNEG	Dummy Variable

M	Mandatory
NACC	Normal Accruals
NI	Net Income
NUMEX	Numbers of Stock Exchanges a Firm's Stock is Listed
$P_t$	Price or Market Value/Market Capitalization in Period t
p./pp.	Page/Pages
$R_t$	Stock Returns
$r_t$	Risk-Free Rate
$R^2$	Determination Coefficient
R&D	Research and Development
$Rev_t$	Revenues
RI	Residual Income
SEC	Securities and Exchange Commission
SFAC	Statement of Financial Accounting Concepts
Size	Natural Log of Total Assets
SME	Small and Medium Sized Entity
SPO	Small Positive Net Income
t/ $\tau$	Time/Period
Turn	Sales Divided by Total Assets
V	Voluntary
$v_t$	Volatility
Var	Variance
WC	Working Capital
$X_t$	Earnings/Income in Period t
$X_t^a$	Residual Income
$X_{CC}$	Long Run Mean of a Company's Earnings
XLIST	Dummy Variable for Stock Listings
$\alpha$	Constant
$\beta$	(Regression) Coefficient/Slope Coefficient
$\Delta$	Delta/Difference
$\rho$	Spearman Correlation
$\sigma$	Standard Deviation
$\varepsilon_t$	Random Part/Noise
$\tau_t$	Random Variable
*, **, ***	Significantly different between each category at 0.01, 0.05, and 0.10
#, ##, ###	Significantly different from 0 at 0.01, 0.05, and 0.10

# 1 Introduction

Over the years, the development of International Financial Reporting Standards (IFRS) was being pushed more and more. Around 120 countries worldwide are following the standard of IFRS already. The question asked in this work is how the earnings quality developed during the application of international standards. Thereby, the time horizon of research is mainly in the years from 2000 to 2006.

The study is interesting in view of the fact that a lot of developments of standard setting have been going on in the last decade. Especially the orientation towards fair value accounting and a balance sheet perspective are of major importance. The work identifies three changes of major impact on earnings quality. These changes are specified in the standards IAS 36 – “Impairment of Assets”, IAS 38 – “Intangible Assets”, and IFRS 3 “Business Combinations.” These assumed key developments of IAS and later IFRS in the context of accounting quality are being discussed.

Before assessing the earnings quality of IFRSs the term “earnings quality” and its attributes is defined and explained. First, earnings are the solely most important outcome of accounting to measure a company’s performance. Earnings are of high quality when they reflect the company’s current operating performance, are a good indicator of future operating performance, and a good measure for assessing firm value. In other words, earnings quality allows decision usefulness.

The difference between earnings and cash flows are accounting-added accruals. Cash flows are often not really related to its underlying economic activities. Accruals shift the cash flows into its attributable periods. These accruals of course require estimations and judgments. The question of reliability and relevancy is raised. Additionally, accruals are more exposed to earnings management and earnings manipulation.

The work in addition clarifies other topics and terms related to earnings quality. Pro-forma earnings are adjusted earnings numbers that are not accepted by accounting standard setters. Managers argue to disclose such figures to provide more information quality; critics state these figures as deceiving. The clean surplus relation (CSR) is covered in order to describe the relationship between a company’s earnings and book values.

Furthermore, the work deals with the topic of earnings measurement. The question in this section is how to measure i.e. evaluate the quality of earnings and accounting. Eight different characteristics and attributes of earnings are being discovered and explained. The measures

are persistence, predictability, volatility and smoothness, quality of accruals, earnings management, timeliness, conservatism, and value relevance. The measures persistence, predictability, and value relevance are able to compare quality of earnings with quality of cash flows.

After all definition is done and backgrounds discussed, the work focuses on a study of Paananen and Lin (2009) that evaluates the earnings quality of international accounting standards over time. An ideal sample for this scope is the sample of German companies reporting under IAS during 2000-2002, under IFRS during 2003-2004 voluntary, and under IFRS during 2004-2006 mandatory. Three of the eight introduced earnings measures are being used for this study. These measures are volatility and smoothness, timeliness, and value relevance.

The results give notice that accounting quality has not improved but worsened over time. Surprisingly, the quality did not decrease because of new IFRS adapters but because of negative changes of the standards. This means that the adaption of IFRS worsened the situation for investors to base their investments on IFRS.

Critical aspects mention that there are other influences on earnings quality than accounting standards. The study of Dichev and Tang (2008) discovers poor matching as another influence on earnings quality. They examine companies over four decades and find that matching of expenses against associated revenues has worsened over time. In their study they explain that poor matching, acting as noise decreases the persistence and increases the volatility of earnings continuously.

## 2 The development of International Accounting Standards over Time

In the last few decades, financial events and transactions on an international extent increased dramatically. Big international IPOs (initial public offerings) became common practice from the 1990s. The various accounting standards in different countries became an unpleasant and costly barrier. In order to meet the needs for such operations, the call for a uniform international accounting standard became louder.

### 2.1 The International Accounting Standards Board (IASB)

The International Accounting Standards Board (IASB) is the standard-setting body of the IFRS Foundation, an independent and not-for-profit private sector organization working in the public interest with seat in London. The IASB is the present standard setter of the International Financial Reporting Standards (IFRS).<sup>1</sup>

The objectives of the IFRS Foundation are:

- "... to develop a single set of high quality, understandable, enforceable and globally accepted international financial reporting standards (IFRSs) through its standard-setting body, the IASB;
- to promote the use and rigorous application of those standards;
- to take account of the financial reporting needs of emerging economies and small and medium-sized entities (SMEs); and
- to bring about convergence of national accounting standards and IFRSs to high quality solutions."<sup>2</sup>

The IASB was preceded by the Board of the International Accounting Standards Committee (IASC) until 2001. The IASC was founded in 1973 by accountancy bodies of Australia, Canada, France, Germany, Japan, Mexico, the Netherlands, the United Kingdom and Ireland, and the United States. Until 2001 the rules set by the IASC were called "International Accounting Standards" (IAS). Since April 2001, the rule-making function has been continued by the IASB. The new standards since then are called "International Financial Reporting Stand-

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<sup>1</sup> Cf. IFRS FOUNDATION (2010a)

<sup>2</sup> IFRS FOUNDATION (2010a)

ards” (IFRS). The old standards IAS are still recognized and accepted. The IASB is better-funded, better-staffed and more independent than the older IASC.<sup>3</sup>

The IASB is responsible for the development and publication of IFRSs, including IFRS for SMEs (small and medium-sized entities), and for approving interpretations of IFRSs by the Interpretations Committee.<sup>4</sup> The IASB commits to follow “A thorough, open, participatory and transparent due process”<sup>5</sup>

The standard-setting board is overseen by a geographically and professionally diversified body of trustees, who report to a monitoring board of public capital market authorities. Furthermore, the trustees are responsible in safeguarding the independence of the IASB and the financing of the organization. The IFRS Foundation is totally private and raised exclusively by public funds.<sup>6</sup>

The standard-setting process is supported by the IFRS Interpretation Committee (formerly known as IFRIC) and an external IFRS Advisory Council. The Interpretation Committee reviews actual issues that are in context with current IFRSs.

In the moment, almost 120 countries have required or permitted the use of IFRSs.<sup>7</sup> The remaining major economies have certain time lines with the aim of adopting or to converge with IFRS in the near future.<sup>8</sup> Especially the convergence between IASB and the FASB (Financial Accounting Standards Board) of the United States is still a matter of action.

The European Union (EU) adopted the IFRSs in 2003. From January 2005 it is mandatory for all listed companies in EU to report under IFRS. Before 2005 the reporting under IFRS was voluntary. By this adoption, the EU made the IFRS the “most widely accepted financial accounting model in the world.”<sup>9</sup>

Since the empirical study of Paananen and Lin (2009) in Chapter 5 examines the case of a European country, namely Germany, they orientate their Panels on these developments in the European Union. They divide the time of research from 2000 to 2006 into three parts: the IAS period from 2000 to 2002, the IFRS<sub>voluntary</sub> period from 2003 to 2004, and the IFRS<sub>mandatory</sub> period from 2005 to 2006. In the European Union the changes of structure and financial

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<sup>3</sup> Cf. BALL (2006), p.6; IASB HISTORY (2006)

<sup>4</sup> Cf. IFRS FOUNDATION (2010a)

<sup>5</sup> IFRS FOUNDATION (2010b)

<sup>6</sup> Cf. IFRS FOUNDATION (2010a,b)

<sup>7</sup> A comprehensive list offers IAS PLUS (2010)

<sup>8</sup> Cf. IFRS FOUNDATION (2010b)

<sup>9</sup> PAANANEN/LIN (2009), p.32

statements changed within this period several times and maybe affected the quality of earnings numbers.

## 2.2 Developments of IAS and IFRS over time

As already mentioned, the focus of this work is mainly from the years 2000 to 2006. A number of revisions in IFRS (IAS) took place in this very period. Especially the change of standard-setting from IASC to IASB in April 2001 and the aligned push in aims led to significant changes in standards.<sup>10</sup>

Although the IASB still accepts IAS standards, more and more standards are being replaced by the IFRSs. By this time the IASB issued already nine new IFRSs and only 29 of the 41 IASs are still accepted.<sup>11</sup> A progress towards more fair value measurement of assets and liabilities is apparent. All these changes are likely to affect the quality of earnings numbers and are therefore an interesting field of research.

Two principles which are forced by modern standards setters like IASB or FASB are fair value accounting and balance sheet perspective. Both principles influence accounting numbers fundamentally, especially since the 1990s.

### 2.2.1 Fair Value Accounting

Fair value accounting, also called mark-to-market accounting uses market prices to value assets and liabilities. Fair values contain more information than historical costs and are therefore more informative for financial statement users.<sup>12</sup>

The condition of either observable market prices or independently observable, accurate estimates must be met indeed. In recent years markets became deeper and more liquid. In addition, procedures of reliable estimations of fair values for assets that are not traded have become more acceptable. These developments are the basis for the enormous growth of fair value accounting. Lately, fair value accounting came under criticism because many markets are still not liquid enough to not be exposed to manipulation and pricing models are maybe too imperfect. Not least, fair value accounting got into suspicion to be a driving force into the last world financial crisis.

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<sup>10</sup> Cf. PAANANEN/LIN (2009), p.32

<sup>11</sup> Cf. IAS PLUS (2010)

<sup>12</sup> Cf. BALL (2006), p.20

Ball (2006) analyzes “fair value” accounting critically and provides a list of IFRS standards with strong fair value orientation:<sup>13</sup>

- IAS 16 – fair value option for property, plant, and equipment
- IAS 36 – impairment of assets on fair value
- IAS 38 – fair value of intangible assets
- IAS 39 – requirement for fair value disclosure of financial instruments
- IAS 40 – fair value option for investment property
- IFRS 2 – share-based payments are required to be valued at fair value
- IFRS 3 – requires minority interests to be disclosed at fair value

### 2.2.2 Balance Sheet Perspective

Balance sheet perspective and revenue recognition principle with the combined matching principle are two different leading beliefs in accounting. To understand the underlying problem, the difference between earnings and cash flows has to be explained first. The quintessence of the discussion is that earnings are more relevant but cash flows are more reliable. Because of the fact that cash flows contain fewer estimates and are usually harder to manage they count as more reliable. With the help of accruals revenues and expenses are recognized in their correct period and are therefore more relevant. The topic is attended later in the work more intensely.<sup>14</sup>

The two approaches have two incompatible views about income.<sup>15</sup> The balance sheet perspective states “Income is an enhancement of wealth or command over economic resources.”<sup>16</sup> This approach contains the intention that assets and liabilities are evaluated at their fair value and changes of these values are represented in equity. In order to not lose reliability the influence of accruals should not be too strong. Accrual estimation errors which are likely in fair value evaluation of assets and liabilities reduce the ability of earnings to predict future cash flows.

The second view states “Income is an indicator of the performance of an enterprise and its management.” This statement agrees with the revenue principle saying that revenues must be earned and realizable in order to be recognized. The matching principle requires expens-

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<sup>13</sup> Cf. BALL (2006), p.19

<sup>14</sup> See for example Chapter 3.4 or 4.8

<sup>15</sup> Cf. DECHOW/SCHRAND (2004), p.11

<sup>16</sup> Storey, R.K./Storey, S.(1998): The Framework of Financial Accounting Concepts and Standards (Special Report). Norwalk, CT: Financial Accounting Standard Board, quoted from: DECHOW/SCHRAND (2004), p.11

es to be in the same period as their revenues. Following these two principles makes accruals more reliable and earnings more useful in prediction of future cash flows.

The accounting standard setters seem to use both perspectives for earnings measurement. As a consequence it is not clear if accruals improve the ability of earnings in predicting future cash flows. An observable tendency of international accounting standards is towards a more balance sheet perspective.<sup>17</sup>

## 2.3 Recent Changes with possible Impact on Earnings Quality

Paananen and Lin (2009) provide an extensive list of all changes and revisions in the IFRS through the periods of research (2000-2006).<sup>18</sup> Of all these changes they consider three of major impact on financial reporting with focus on earnings quality. These three changes happen in IAS 36 – “Impairment of Assets”, IAS 38 – “Intangible Assets”, and IFRS 3 – “Business Combinations.”<sup>19</sup> It is noticeable that all three standards are listed in Ball’s enumeration of standards with strong fair value orientation too.

### 2.3.1 IAS 36, Impairment of Assets

The objective of IAS 36 is “To ensure that assets are carried at no more than their recoverable amount, and to prescribe how recoverable amount is calculated.”<sup>20</sup> In accordance to this standard, companies are required to revalue annually their assets with a procedure called impairment test. An impairment test makes sure that assets or cash generating units are not higher valued than their recoverable amount. The recoverable amount is “...the higher of an asset’s or cash-generating unit’s fair value less costs to sell and its value in use.”<sup>21</sup> The company has to write off its assets to the recoverable amount. Any impairment loss is recorded as an expense in the income statement.<sup>22</sup>

Value in use is the discounted estimated future cash flows of the use of an asset plus its disposal at the end. An impairment test is applied to goodwill and other intangible assets with indefinite lives at least annually.<sup>23</sup>

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<sup>17</sup> Cf. DECHOW/SCHRAND (2004), p.12

<sup>18</sup> Cf. PAANANEN/LIN (2009), pp.34-36 (Table1)

<sup>19</sup> Cf. PAANANEN/LIN (2009), p.33

<sup>20</sup> IASB IAS 36.1

<sup>21</sup> IASB IAS 36.18

<sup>22</sup> Cf. IAS PLUS (2010), p.95

<sup>23</sup> Cf. IAS PLUS (2010), p.95

### 2.3.2 IAS 38, Intangible Assets

This standard prescribes "...the accounting treatment for recognising, measuring and disclosing all intangible assets that are not dealt with specifically in another IFRS."<sup>24</sup> An intangible asset is recognized if the conditions identifiability, control, and reliable measurability are met. Identifiability is defined as the ability to distinguish the asset from goodwill.<sup>25</sup> Separability is a sufficient condition but is not necessarily required by IAS 38. A contractual or other legal rights that is separable from the entity counts too.<sup>26</sup> An entity has control over an asset "...if the entity has the power to obtain the future economic benefits flowing from the underlying resource and to restrict the access of others to those benefits."<sup>27</sup> The third condition simply requires that the cost of an asset can be measured reliably.<sup>28</sup>

The standard regulates that all research costs are expensed immediately; development costs can be capitalized under certain conditions.<sup>29</sup> Internally-generated goodwill is per definition never being recognized as one single identity. If an intangible asset has an indefinite life it is assessed in accordance with IAS 36.<sup>30</sup>

### 2.3.3 IFRS 3, Business Combinations

"A business combination is a transaction or event in which an acquirer obtains control of one or more businesses."<sup>31</sup> For such a purchase the IFRS requires to measure all assets and liabilities at their acquisition-date fair value. This procedure is also referred as acquisition method.<sup>32</sup> The difference between the fair value of the purchase and the aggregate fair values of the identifiable assets and liabilities of the acquiree are recognized as the goodwill.<sup>33</sup>

The goodwill is not amortized but is subject to an annual impairment test, in accordance with IAS 36. If negative goodwill occurs, the gain is recognized in the income statement.<sup>34</sup>

These recent developments have led to changes in accounting quality of IFRS. The orientation towards more fair-value accounting standards is apparent. The question this work wants to answer is whether the quality has increased or not.

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<sup>24</sup> IAS PLUS (2010), p.98

<sup>25</sup> Cf. IASB IAS 38.11

<sup>26</sup> Cf. IASB IAS 38.12

<sup>27</sup> IASB IAS 38.13

<sup>28</sup> Cf. IASB IAS 38.21

<sup>29</sup> Cf. ALEXANDER (2007), p.293

<sup>30</sup> Cf. IAS PLUS (2010), p.99

<sup>31</sup> IAS PLUS (2010), p.44

<sup>32</sup> Cf. IASB IFRS 3.5

<sup>33</sup> Cf. IASB IFRS 3.32-33

<sup>34</sup> Cf. ALEXANDER (2007), p.301

## 3 Defining Earnings Quality

Accounting earnings and not cash flows are simply the most important output to measure a company's performance. Earnings have a wide range of use and users. They are applied in debt covenants, in management compensation, for creditors, investors, and in advertising when going public.<sup>35</sup> Therefore, firms' managers do everything to provide financial statement users with earnings that meet or beat benchmarks and analysts' estimates.<sup>36</sup> Thus, to analyze the quality and properties of earnings is a very interesting field of research.

### 3.1 Earnings and Earnings Quality

The term "quality" in the context of accounting is understood as the satisfaction of the demand for financial reporting.<sup>37</sup> Both standard setters FASB and IASB are dedicating themselves to "...achieve a single set of high quality, global accounting standards..."<sup>38</sup> The IASB describes in its exposure draft of conceptual framework "The objective of general purpose financial reporting is to provide financial information about the reporting entity that is useful to present and potential equity investors, lenders, and other creditors in making decisions in their capacity as capital providers."<sup>39</sup> The key to this intention are qualitative characteristics or attributes that make financial information useful.

The measure about an enterprise's financial performance is provided by earnings and its components.<sup>40</sup> Hicks (1946) defines income (earnings) as the amount an individual can spend within a period and still expects to be able to spend the same amount in the following period(s).<sup>41</sup> Adjusted to companies, earnings are the amount a company can pay out as dividends without leaving the entity worse off for the next period. This is consistent with the use of the term originally in the financial statements as outcome of the income statement.

In this context, earnings quality would be simply a quality measure of equity valuation. By now, the term is understood more broadly and multifaceted.<sup>42</sup> Earnings and its components

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<sup>35</sup> Cf. DECHOW (1994), p.4

<sup>36</sup> Cf. GRAHAM et al. (2005), p.5

<sup>37</sup> Cf. BALL (2006), p.9; WAGENHOFER/DÜCKER (2007), p.264

<sup>38</sup> TWEEDIE/HERZ (2010)

<sup>39</sup> IASB FRAMEWORK (2008), QC1

<sup>40</sup> Cf. FASB SFAC 1.43

<sup>41</sup> Cf. HICKS (1946), p.174

<sup>42</sup> Cf. DECHOW et al. (2009), p.139

give information in various ways and purposes. Some uses are the evaluation of management's performance, estimation of "earnings power", prediction of future earnings, and risk assessment of investing or lending money to a company.<sup>43</sup> "It is accounting's summary measure of a firm's performance."<sup>44</sup>

The term "earnings quality" varies a lot. There are a numerous different existing definitions of this denotation. Dechow and Schrand (2004) define earnings quality from the perspective of the analyst. They say that, "The objectives of financial analysis are to evaluate the performance of the company, to assess the extent to which current performance is indicative of future performance, and based on this analysis, to determine whether the current stock price reflects intrinsic firm value. From this perspective, a high-quality earnings number is 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."<sup>45</sup> In a nutshell they define earnings to be of high quality when the earnings number accurately annuitizes the intrinsic value of the firm.

Dechow et al. (2009) add that "Higher quality earnings more faithfully represent the features of the firm's fundamental earnings process that are relevant to a specific decision made by a specific decision-maker."<sup>46</sup> In other words, earnings quality is defined as decision usefulness. This definition implies that "earnings quality" depends on the decision context; the relevancy of a firm's earnings process varies among decisions and decisions makers.

## 3.2 Earnings Attributes

Earnings quality is not based on only one attribute. Different proxies determine the measurement of earnings quality. In accordance to IASB's conceptual framework and Wagenhofer/Dücker (2008) the most significant earnings measures are persistence, predictability, volatility, quality of accruals, earnings management, timeliness, conservatism and value relevance.<sup>47</sup> Each of those attributes contributes to the usefulness of information provided by financial reporting. Chapter 3 describes these measures more in detail.

All these determinants of earnings quality use as core variable the reported earnings number of the financial statements. These earnings numbers "... are affected by both the firm's fun-

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<sup>43</sup> Cf. FASB SFAC 1.47; Earnings power is paraphrased with amounts perceived as "representative" of long-term earning ability of an enterprise.

<sup>44</sup> DECHOW et al. (1998), p.133

<sup>45</sup> DECHOW/SCHRAND (2004), p.5

<sup>46</sup> DECHOW et al. (2009), p.1

<sup>47</sup> Cf. WAGENHOFER/DÜCKER (2007), p.271; IASB FRAMEWORK (2008), QC1-26

damental earnings process and by the measurement of that process.”<sup>48</sup> Reported earnings are the sum of “fundamental” earnings plus an error generated by the imperfect accounting system. The fundamental earnings are outcome of different economic processes and are unobservable; the error term describes the ability or inability of the accounting system to measure these processes. Current research does not make a distinction between those two determinants of earnings. As a result it is only possible to evaluate earnings quality in general but not the contribution of accounting measurement to reported earnings.<sup>49</sup>

Another point is that each earnings metric measures only a part of the quality and not the whole spectrum of aspects.<sup>50</sup> Also, it is sometimes difficult to distinguish between earnings quality and earnings management. Some measures are even hard to interpret whether they are a positive or a negative indicator.<sup>51</sup> To mitigate this kind of measurement error, most studies aggregate several factors to a summary of measures.<sup>52</sup> This solution bears the risk that some measures are inconsistent to each other, overlap, or even measure in the opposite direction.<sup>53</sup> Wagenhofer and Dücker (2007) find relations which are not expected and hard to categorize.<sup>54</sup>

Anyway, the quality and extent of financial statement information is limited by two pervasive constraints – materiality and cost.<sup>55</sup> First, the IASB describes an information as material when “its omission or misstatement could influence the decisions” of the financial statement user. A certain threshold is not indicated since “materiality depends on the nature and amount of the item judged.” The second restraint describes the relationship between costs and benefits of financial reporting. The IASB explains that the benefits of provided information should “justify the related costs.” This assessment of economy of financial reporting will often “be more qualitative than quantitative.”

### 3.3 Earnings and Pro-Forma Earnings

Pro forma earnings are adjusted earnings numbers that exclude certain items like write-downs, goodwill, amortization, depreciation, restructuring and merger costs, interest, taxes, and other expenses. Such adjustments are done for different reasons and are not accepted

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<sup>48</sup> DECHOW et al. (2009), p.139

<sup>49</sup> Cf. DECHOW et al. (2009), pp.5-7, 139

<sup>50</sup> Cf. WAGENHOFER/DÜCKER (2007), p.265

<sup>51</sup> Cf. SCHIPPER/VINCENT (2003), p.101; WAGENHOFER/DÜCKER (2007), p.265

<sup>52</sup> Cf. BHATTACHARYA et al. (2003), p.649; BIDDLE/HILARY (2006), p.969; LEUZ et al. (2003), p.511

<sup>53</sup> Cf. SCHIPPER/VINCENT (2003), p.106

<sup>54</sup> Cf. WAGENHOFER/DÜCKER (2007), p.265

<sup>55</sup> Cf. IASB FRAMEWORK (2008), QC1, QC28-33

by standard setters like IASB or FASB. In recent years it became very common for companies to release such adjusted earnings numbers in press releases along with official (IFRS or other GAAP) earnings numbers.<sup>56</sup> Common pro forma figures are EBIT – “earnings before interest and tax”, EBITA – “earnings before interest, tax, and amortization”, or EBITDA – “earnings before interest, tax, depreciation, and amortization.”<sup>57</sup>

For many analysts, the prediction of future financial performance is the main purpose of earnings numbers. Companies may obtain higher stock prices and better financing conditions when they present favorable expectation about future earnings numbers.<sup>58</sup> A help to achieve such goals are apparently the use of pro-forma earnings. Managers claim that such numbers increase information quality and provide a better view of the company’s core earnings. Critics argue that companies sometimes use pro forma figures in order to distract investors and maybe even try to deceive them.<sup>59</sup> This earned pro forma earnings the denotation EBS – “everything but bad stuff.”<sup>60</sup>

### 3.4 Earnings and Cash Flows

As already stated earnings and not cash flows are the most important measure to indicate whether an entity’s performance is successful. In contrast to earnings cash flows are often not related to its underlying economic activities. FASB demonstrates that financial statements showing only cash flows cannot adequately assess the financial performance.<sup>61</sup> They explain that operations or events that affect an enterprise during a period do not always “...coincide with the cash receipts and payments of the period.” Accrual accounting and its outcome earnings try to record financial effects with cash consequences in the periods they “...occur rather than only in the periods in which cash is received or paid by the enterprise.”<sup>62</sup> The IASB adds that cash flows are important to describe an enterprise’s performance but “...financial performance measured by accrual accounting more closely tracks the occurrence of transactions and other events and circumstances that have affected the entity’s wealth during the period.”<sup>63</sup>

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<sup>56</sup> Cf. BLACK/CHRISTENSEN (2009), p.297-298

<sup>57</sup> Cf. WAGENHOFER (2010), p.217-218

<sup>58</sup> Cf. FRIDSON/ALVAREZ (2002), p.63

<sup>59</sup> Cf. PENMAN (2007), p.49

<sup>60</sup> Dow Jones & Company Inc. (2001): SEC Probes 4 Firms for Possible Abuses of Pro-Forma Results, in Dow Jones Newswires, June 19<sup>th</sup> 2001, quoted from: BLACK/CHRISTENSEN (2009), p.298

<sup>61</sup> Cf. FASB SFAC 1.43

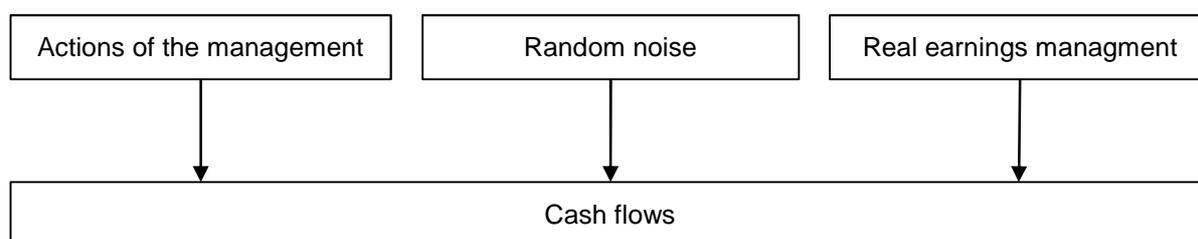
<sup>62</sup> FASB SFAC 1.44

<sup>63</sup> IASB FRAMEWORK (2008), BC1.38

A simple analytical connection defines periodical earnings  $X_t$  as the sum of operative cash flows  $CFO_t$  plus accruals  $ACC_t$ .<sup>64</sup>

$$X_t = CFO_t + ACC_t \quad (1)$$

The quality of earnings as a performance measure depends on the quality of both cash flow numbers and accrual numbers. Operative cash flows  $CFO_t$  are influenced by random noise and decisions by management, called “real earnings management” Actions of the management are essential for the quality of information; however random noise and real earnings management may decrease the level of information.



Source: based on WAGENHOFER/DÜCKER (2007), p.269

**Figure 1: Determinants of cash flows**

Accruals  $ACC_t$  divide cash flows into its attributable periods. Information and risk is being converted and earnings are usually smoothed out. Earnings accruals have different determinants: Matched accruals, accruals distributed over time, method of valuation, mistakes in valuation and estimation, and accounting earnings management.

Accruals require in contrast to cash flows a lot more estimations and judgments. Even in accordance with proper accounting standards the quality of earnings can vary among different entities a lot. This leads to the doubt if earnings obtained by accrual accounting are reliable because of the danger of estimation or discretion errors. On the other hand, only accrual accounting leads to results reflecting the underlying economic events and performance. Nevertheless, large accruals may adhere errors of estimation, thus may indicate low earnings quality.<sup>65</sup>

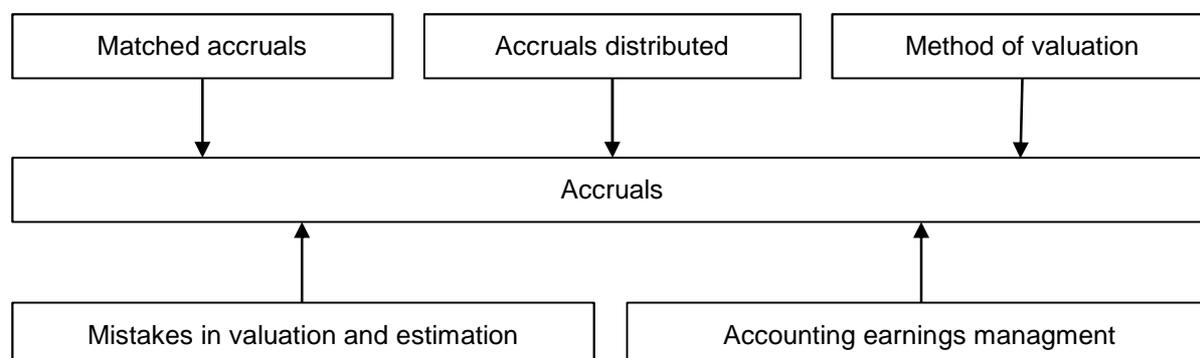
The first three influences in Figure 2 are positive for the quality of information. Accruals are matched when expenses are reported in the same period when sales are made.<sup>66</sup> When expenses cannot be traced they are distributed over time. Typical examples are assets which are depreciated over certain periods. The third determinant is the method of valuation. To

<sup>64</sup> Cf. WAGENHOFER/DÜCKER (2007), p.268

<sup>65</sup> Cf. DECHOW/SCHRAND (2004), p.6

<sup>66</sup> See also Chapter 6

evaluate financial instruments the IASB leaves for example a certain range of choice between different methods of valuation.<sup>67</sup> In contrast mistakes in valuation and estimation, as well as accounting earnings management decreases the standard information in accruals.



Source: based on WAGENHOFER/DÜCKER (2007), p.269

**Figure 2: Determinants of accruals**

In practice it is hard to distinguish between all influences on earnings. Most of them are rarely to measure individually. Especially the difference between proper accrual accounting and earnings management is hard to find. Researchers differ fundamentally in this point.<sup>68</sup> Since “real earnings management” is nearly impossible to measure, most studies do not cover this point anyway.<sup>69</sup>

### 3.5 Earnings Quality and Earnings Management

Wagenhofer and Ewert (2007) use the term “earnings management” not necessarily in an exclusive negative way. Moreover they describe earnings management as “the management’s utilization of its area of discretion.”<sup>70</sup> Other researchers see earnings management as the intentional mislead of related parties by distorting facts of disclosure.<sup>71</sup> Anyway, earnings management is not always but often the outcome of intentional distortion of accounting figures and it is very likely that earnings management is bad for earnings quality.<sup>72</sup>

“Real earnings management” describes decisions of management that really influences cash flows and economic procedures. Examples in the short term of “real earnings management” are changes in payments, sale of assets, or changes in inventory and securities. Alternatives

<sup>67</sup> Cf. IASB IAS 39.9

<sup>68</sup> Cf. SCHIPPER/VINCENT (2003), p.101; See also Chapter 4.3

<sup>69</sup> Cf. WAGENHOFER/DÜCKER (2007), p.270

<sup>70</sup> WAGENHOFER/EWERT (2007), p.237

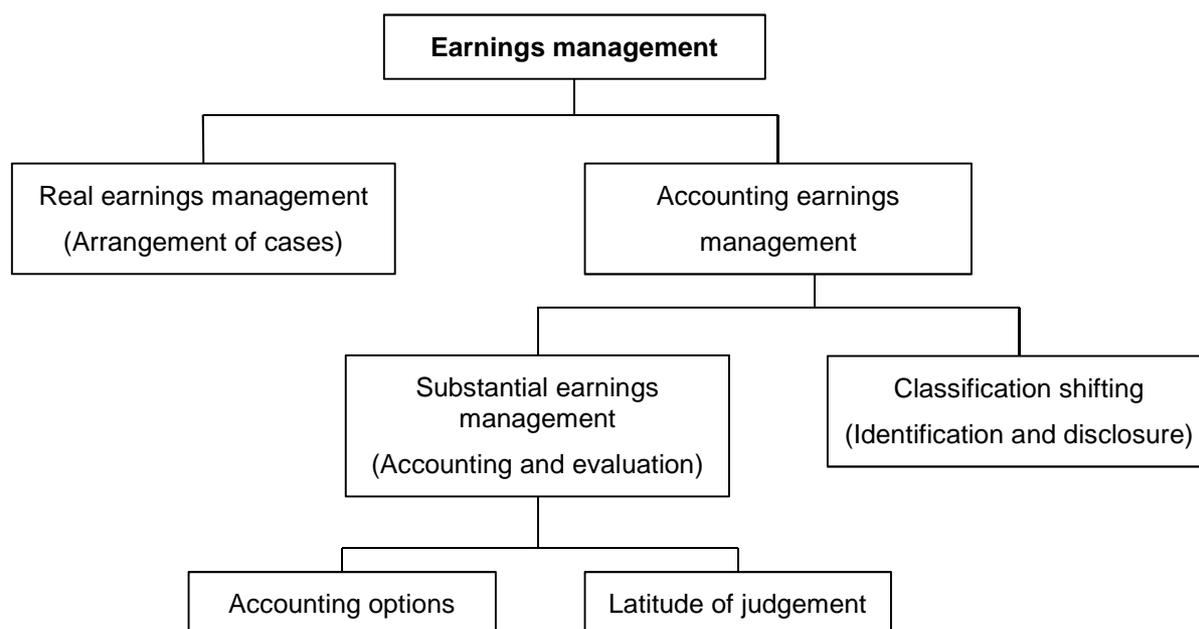
<sup>71</sup> Cf. for example HEALY/WAHLEN (1999), p.368; LO (2008), p.351; LEUZ et al. (2003), p.506

<sup>72</sup> See also Chapter 4.5

in the long run are changes in contracts with impact on financial statements. A common example for this practice is “sale and lease back” where assets are sold and at the same time leased back.<sup>73</sup>

“Accounting earnings management” applies to transactions that are already performed. This form of earnings management only affects accruals. Wagenhofer and Ewert (2007) differentiate into “classification shifting” and “substantial earnings management”. First, classification shifting means the attempt of management to disclose accounting items in a certain way. A common practice for instance is the disclosure of irregular items and the calculation of proforma earnings.<sup>74</sup>

Second, substantial earnings management is either to manage earnings with the use of accounting options or with latitude of judgment. Especially the IFRS leave a lot of room for discretionary decisions rather than for accounting options. However, IAS 39.9 for example offers accounting options to categorize and value financial instruments. A representative for latitude of judgment is IAS 38<sup>75</sup>, the activation of development costs. The defined criteria there leave scope of discretion.<sup>76</sup>



Source: WAGENHOFER/EWERT (2007), p.239 (modified)

**Figure 3: Earnings management overview**

<sup>73</sup> Cf. WAGENHOFER/EWERT (2007), p.238-241

<sup>74</sup> See Section 3.3

<sup>75</sup> Cf. IASB IAS 38.57

<sup>76</sup> Cf. WAGENHOFER/EWERT (2007), p.241-242

In terms of earnings management, financial statement users have more trust in cash flows than in earnings. One reason is as already covered the scope of estimation in the accrual part of earnings that eases intentional earnings manipulation. Beyond that to manipulate cash flows is simply harder than accruals. To arrange cases in order to change cash flows requires "...manipulation of transactions and/or their timing..." and may affect other parties. In contrast manipulation of accruals "...only requires a journal entry."<sup>77</sup> Still there has been manipulation of cash flows, like the cases of Parmalat or WorldCom showed, but the estimation of accruals allows even more possibilities for earnings manipulation.<sup>78</sup>

### 3.6 Earnings Quality and Equity Valuation

Assuming that economy is risk neutral and all market participants have homogenous beliefs, a firm's market value equals the present value of future expected net dividends. This relationship is described in the dividend discount model (DDM):<sup>79</sup>

$$P_t = \sum_{\tau=1}^{\infty} \frac{E_t(d_{t+\tau})}{(1+r_t)^\tau} \quad (\text{DDM})(2)$$

$P_t$  is the price or the market value of the firm's equity,  $d_t$  is net dividends paid,  $E_t$  is an expectation conditional on information, and  $r_t$  is the risk-free rate.

Penman and Sougiannis (1998) state the model as insufficient because it requires the prediction of dividends to infinity for going concern.<sup>80</sup> Ohlson (1995) proposes the model written in terms of earnings and book value. This model is used as an earnings quality measure to assess value relevance.<sup>81</sup> It does not rely on common accounting standards or constructs like "economic earnings."<sup>82</sup> In order to describe the relationship between earnings and book value, the clean surplus relation (CSR) is needed.

Clean surplus accounting is referred to the researchers Preinreich (1937) and Lücke (1955) and describes that all changes in equity, that are not transactions between firm and owners must be captured in the income statements.<sup>83</sup>

$$B_t = B_{t-1} + X_t - d_t \quad (\text{CSR})(3)$$

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<sup>77</sup> DECHOW/SCHRAND (2004), p.17

<sup>78</sup> Cf. DECHOW/SCHRAND (2004), p.11

<sup>79</sup> Cf. OHLSON (1995), p.666; PENMAN/SOUGIANNIS (1998), p.348

<sup>80</sup> Cf. PENMAN/SOUGIANNIS (1998), p.348

<sup>81</sup> The model is introduced in Section 4.8

<sup>82</sup> OHLSON (1995), p.666

<sup>83</sup> Cf. WAGENHOFER/EWERT (2007), p.111

The measured book value of equity  $B_t$  is last years' book value  $B_{t-1}$  plus earnings minus dividends. Substituting the CSR model into the DDM equation leads to the following equation.<sup>84</sup>

$$P_t = X_t + \sum_{\tau=1}^{\infty} \frac{E_t(X_{t+\tau}^a)}{(1+r_t)^\tau} \quad (4)$$

Each forecast of dividends in the DDM can be rewritten in terms of earnings and book values.<sup>85</sup> These numbers have in contrary to dividends a finite-horizon forecast.<sup>86</sup> Figure  $X_t^a$  is defined as the “residual income”<sup>87</sup> RI or “abnormal earnings.”<sup>88</sup> The term “abnormal earnings” is originated because “normal” earnings would relate to the return on the capital invested at the beginning of the period. Abnormal earnings instead “...interpret  $X_t^a$  as earnings minus a charge for the use of capital.”<sup>89</sup>

$$X_t^a = X_t - r_t B_{t-1} \quad (\text{RI})(5)$$

Equation (4) describes “... a firm's value equals its book value adjusted for the present value of anticipated abnormal earnings. In other words, the future profitability as measured by the present value of the anticipated abnormal earnings sequence reconciles the difference between market and book values.”<sup>90</sup>

In a nutshell, earnings are used in several valuation systems like equity valuation. In order to achieve useful valuations and forecasts, earnings quality should have a certain degree of quality. A study of Penman and Sougiannis (1998), examined in Section 4.8.1, provides evidence that earnings figures are the best alternative for equity evaluation.

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<sup>84</sup> Cf. OHLSON (1995), p.667; PENMAN/SOUGIANNIS (1998), p.348; DECHOW/SCHRAND (2004), p. 9; WAGENHOFER/EWERT (2007), p.111

<sup>85</sup> Cf. DECHOW/SCHRAND (2004), p.9

<sup>86</sup> Cf. PENMAN/SOUGIANNIS (1998), p.349

<sup>87</sup> Cf. WAGENHOFER/EWERT (2007), p.112

<sup>88</sup> Cf. OHLSON (1995), p.667

<sup>89</sup> OHLSON (1995), p.667

<sup>90</sup> OHLSON (1995), p.667

## 4 Measurement of Earnings Quality

Indicators of earnings quality are also called earnings attributes. In this section eight different measures of earnings quality are introduced which are considered by literature as the most important ones.<sup>91</sup> They can be classified into accounting- and market based indicators and refer to the qualitative characteristics of the IASB.<sup>92</sup> Persistence, predictability, and volatility/smoothness are accounting based; quality of accruals, earnings management, timeliness, conservatism and value relevance compare accounting numbers to stock market numbers.

### 4.1 Persistence

Persistence is a measure of how much current occasions influence earnings in the future. The more persistent earnings are, the higher the quality of earnings is. Persistent earnings are more sustainable and therefore more desirable.<sup>93</sup> For this reason it is important to deduct non-recurring effects from recurring items. In other words, companies try to identify core earnings.<sup>94</sup>

Persistence is measured with a regression equation. Next year's earnings  $X_{t+1}$  equal the constant  $\alpha$  plus this year's earnings  $X_t$  multiplied by the coefficient  $\beta$  plus the random part  $\varepsilon_t$ .<sup>95</sup>

$$X_{t+1} = \alpha + \beta \times X_t + \varepsilon_t \quad (6)$$

The higher the coefficient  $\beta$ , the higher the persistence of earnings is. A value of 1 is the maximum. The separation of earnings into a cash flow part  $CFO_t$  and an accruals part  $ACC_t$  leads to Equation (7), filtering out the influence of cash flows and accruals on persistence.<sup>96</sup>

$$X_{t+1} = \alpha + \beta_1 \times CFO_t + \beta_2 \times ACC_t + \varepsilon_t \quad (7)$$

Sloan (1996) shows empirically that  $\beta_1$  is significantly higher than  $\beta_2$ .<sup>97</sup> His study describes regressions of future performance on current earnings performance with cash flow and ac-

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<sup>91</sup> Cf. FRANCIS et al. (2004), p.972; WAGENHOFER/DÜCKER (2007), p.271;

<sup>92</sup> Cf. IASB FRAMEWORK (2008), QC1-33, BC2.1-64

<sup>93</sup> Cf. FRANCIS et al. (2004), p.972

<sup>94</sup> Cf. WAGENHOFER/DÜCKER (2007), p.271; See also Section 3.3

<sup>95</sup> Cf. DECHOW/SCHRAND (2004), p.12; WAGENHOFER/DÜCKER (2007), p.271; FRANCIS et al., 2004, p.980

<sup>96</sup> Cf. WAGENHOFER/DÜCKER (2007), p.271

<sup>97</sup> Cf. SLOAN (1996), p.289,290

cruals part. The outcome is briefly represented in Table 1. The table shows that earnings have a persistence coefficient of 0.841, accruals only 0.756, and cash flows 0.855. This means, "...earnings that backed by cash flows are more persistent than earnings that represent accruals."<sup>98</sup>

**Table 1: Regressions of future performance on current earnings performance**

Variable	Earnings, only		Accruals and cash flows	
	Coefficient	t-Statistic	Coefficient	t-Statistic
Intercept	0.015	32.57	0.011	24.05
Earnings	0.841	303.98		
Accruals			0.756	186.53
Cash from operations			0.855	304.56

Notes: 40,679 company-years. All variables scaled by average assets.

Source: SLOAN (1996), pp.299,300 in the form of DECHOW/SCHRAND (2004), p.17

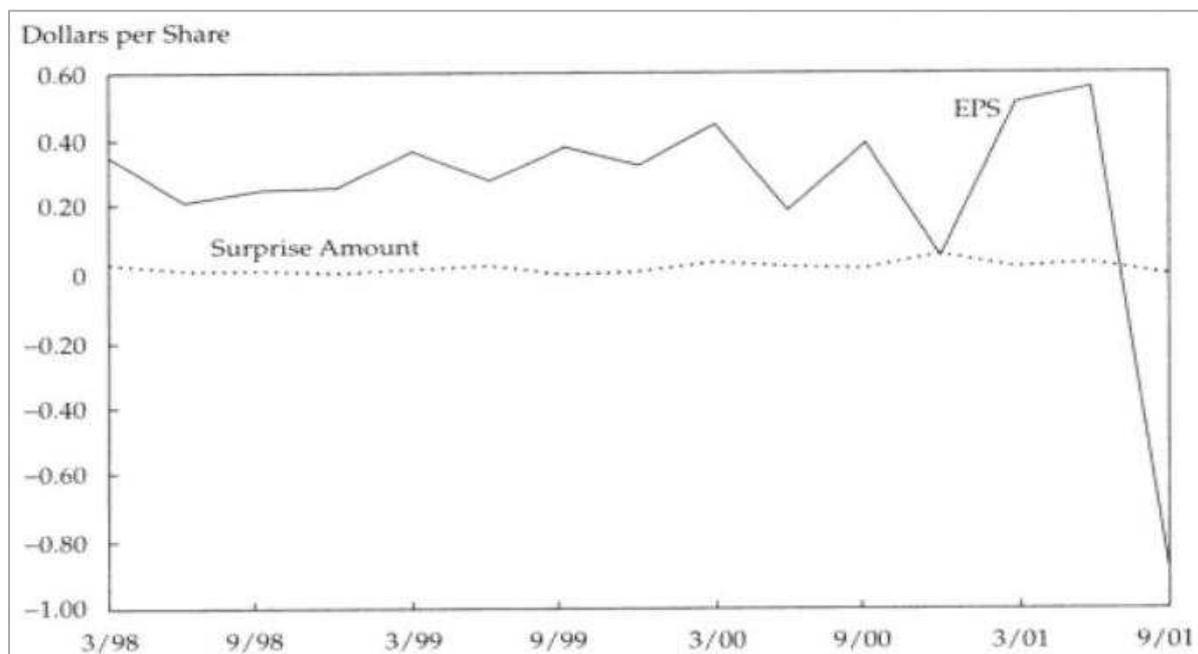
Reasons for this phenomenon are over- and understatements of accruals that are cleared out in other periods. This results in higher volatility of accruals than cash flows.<sup>99</sup> A more detailed explanation of accruals is given in Section 4.4.

Persistence of earnings is a useful measure but is not a guarantee for high quality in earnings. It is important to achieve high persistence for companies because investors and analysts appreciate sustainability and predictability of earnings. Managers of companies may reach this by using pro forma earnings and exclude nonrecurring items. This makes earnings predictable and persistent in the short run. The challenge in this procedure is that earnings should still reflect the intrinsic value of a company.<sup>100</sup>

<sup>98</sup> DECHOW/SCHRAND (2004), p.16

<sup>99</sup> Cf. DECHOW/SCHRAND (2004), p.16

<sup>100</sup> Cf. DECHOW/SCHRAND (2004), p.5,6



Source: DECHOW/SCHRAND (2004), p.6

**Figure 4: Enron quarterly earnings per share and earnings surprises**

The company Enron did hide in the period of 1998 to the second quarter of 2001 huge losses as nonrecurring charges. Enron's earnings were both predictable and persistent, but did not annuitize the intrinsic value of the firm nor were useful for the prediction of future performance. Actually, the earnings were of very low quality.

### 4.1.1 Earnings versus Cash Flows

The advantages and disadvantages of cash flows and earnings have been examined already. An interesting point is whether earnings or cash flows are more persistent. Dechow and Schrand (2004) investigated a sample of 56,940 company-years of reported cash flows and earnings reported under US GAAP from 1987 to 2002.<sup>101</sup> The persistent parameter  $\beta$  in Table 2 is indicating that earnings numbers are generally more persistent than cash flow numbers. The more down an item on the income statement is the more extraordinary items are included and persistence sinks. Thus, referring to persistence it is more useful to make decisions based on earnings numbers than on cash flow numbers.

**Table 2: Persistence of income statement and cash flow statement items**

Item	Estimated Persistence Parameter
Sales	0.85
Operating income before depreciation	0.76
Operating income after depreciation	0.76
Pretax income	0.72
Earnings before special items	0.71
Earnings before extraordinary items	0.71
Cash flow from operations	0.65
Free cash flow	0.41
Cash flow from financing activities	0.30
Cash flow from investing activities	0.25

Source DECHOW/SCHRAND (2004), p.13

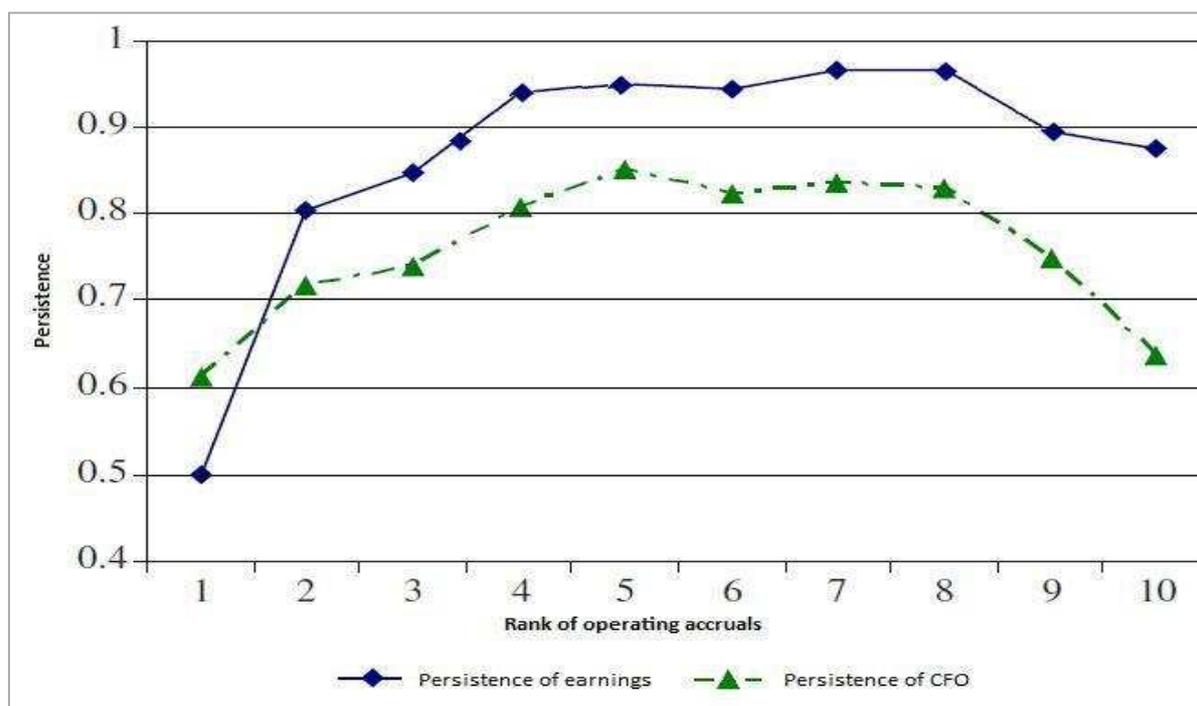
At first view these findings seem to be inconsistent with the findings before stating that the cash flow part of earnings is more persistent than the accruals part. Dechow and Schrand (2004) call this relationship “accrual anomaly” and find the solution in the magnitude of accruals.<sup>102</sup>

Dechow and Ge (2006) observe all available firm-years from 1988 to 2002 and rank them into deciles based on their magnitude of accruals. This is simply earnings less cash from operations scaled by total assets. Decile 1 shows observations with large negative accruals and decile 10 with large positive accruals. The regressions for persistence of cash flows and accruals are made with Equation (6).<sup>103</sup>

<sup>101</sup> Cf. DECHOW/SCHRAND (2004), p.13

<sup>102</sup> Cf. DECHOW/SCHRAND (2004), p.16

<sup>103</sup> Cf. DECHOW/GE (2006), pp.259-261



Source: DECHOW/GE (2006), p.266 (modified)

**Figure 5: Persistence of earnings and cash flows as a function of the magnitude of current accruals**

An overall regression over the whole sample shows that persistence of earnings is with 0.71 on average higher than of cash flows with 0.65. This is conforming the data of Dechow and Schrand (2004) in Table 2. In addition the separation into the deciles shows a differential picture. While earnings have high persistence close to 1.00 when accruals are relatively small, persistence is falling rapidly with larger accruals of either sign. These findings support the statement of Sloan (1996).<sup>104</sup> The reason for it is companies with high magnitude of accruals "... are operating in more volatile business environments."<sup>105</sup>

Furthermore, Dechow and Ge (2006) show that persistence of earnings in high accrual firms is higher in relation to cash flow persistence than the persistence in low accrual firms relatively to cash flow persistence. Especially they point out that the lower persistence of earnings in low accrual firms is due to the fact of special items.

<sup>104</sup> Cf. DECHOW/GE (2006), pp.265-267

<sup>105</sup> DECHOW/GE (2006), p.292

## 4.2 Predictability

“The predictability of earnings is defined as the ability of past earnings to predict future earnings.”<sup>106</sup> As predictability rises, current earnings information becomes more relevant in predicting future earnings. It is a function of variance of shocks in the earnings process. With decreasing variance, the predictability increases.<sup>107</sup>

Earnings persistence and predictability are closely related. The more persistent the earnings the more predictable they are. The same regression equation as for persistence is used but it is measured with the determination coefficient  $R^2$ . A high  $R^2$  indicates high predictability and this means high earnings quality. As an alternative to determine the predictability the standard deviation of the error term  $\varepsilon_t$  is used. A small standard deviation indicates high predictability.<sup>108</sup>

A disadvantage of predictability as a measure of quality is that earnings with higher predictability tend to have lower information content. Another problem is that the measure is not only dependent on earnings numbers but also on other information disclosed. Additional information is found in the financial statements, in the news, or on the company's homepage. Considering such additional information, earnings numbers may appear differently.

Instead of using earnings, an alternative is to use cash flows to predict future cash flows. As measurement figure either  $R^2$  or the standard deviation of the error terms is used.

$$CFO_{t+1} = \alpha + \beta * X_t + \varepsilon_t \quad (8)$$

Dividing earnings into cash flows and accruals leads to Equation (9):

$$CFO_{t+1} = \alpha + \beta_1 * CFO_t + \beta_2 * ACC_t + \varepsilon_t \quad (9)$$

### 4.2.1 Earnings versus Cash Flows

Finger (1994) investigated empirically the ability of cash flows and of earnings in predicting future cash flows and future earnings. In addition she compared them to random walk models assuming uncorrelated earnings changes.

The random walk process is for example  $X_t = X_{t-1} + \varepsilon_t$ . Variable  $\varepsilon_t$  is a random variable with variance  $\sigma^2$  and  $cov(\varepsilon_t, \varepsilon_{t-1}) = 0$ . Finger used a sample of 50 firms from 1935 to 1987 and analyzed it with regression Equations (6) and (8).<sup>109</sup>

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<sup>106</sup> LIPE (1990), p.50

<sup>107</sup> Cf. FRANCIS et al. (2004), p.972; LIPE (1990), p.50

<sup>108</sup> Cf. WAGENHOFER/DÜCKER (2007), p.272; FRANCIS et al. (2004), p.972

<sup>109</sup> Cf. DECHOW et al. (1998), p.136; FINGER (1994), p.210-212

The outcome of the study shows that earnings are a significant predictor of future earnings. Nevertheless for one-year-ahead predictions the random walk model provides better sample forecasts. For four and eight years predictions the earnings outperform other models. The ability of earnings in indicating future cash flows is undetermined. The test shows that cash flows are a better forecast for cash flows in the short run. In the long run earnings and cash flows are approximately equal in prediction of cash flows.

Dechow et al. (1998) examined a sample of 1337 firms for a period from 1963 to 1992. They conclude that earnings have a better ability in predicting future cash flows for a longer period than cash flows.<sup>110</sup> Barth et al. (2001) extend these findings and suggest disaggregating earnings into cash flows and six accrual components – change in accounts receivable, change in inventory, change in accounts payable, depreciation, amortization, and other accruals.<sup>111</sup> This break down leads to a significant increase of R<sup>2</sup>.

### 4.3 Volatility and Smoothness

These attributes deal with the smoothness of earnings. The smoother earnings, the less volatile they are. Smooth earnings are more persistent and predictable. Because volatility is associated with risk, smooth earnings are more popular.<sup>112</sup> Usually cash flows are relatively volatile, pro forma earnings are smooth because one-time items are less frequently considered. It is said that “volatility can be reduced, at the expense of timeliness”<sup>113</sup>.

Leuz et al. (2002) use two measures for volatility.<sup>114</sup> The first one, Equation (10), determines the relation of volatility of earnings to volatility of cash flows.

$$\frac{\sigma(X_t)}{\sigma(CFO_t)} \quad (10)$$

The second one is the Spearman correlation of the change in accruals and the change in cash flows from operations.

$$\rho(\Delta ACC_t, \Delta CFO_t) \quad (11)$$

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<sup>110</sup> Cf. DECHOW et al. (1998), p.166

<sup>111</sup> Cf. BARTH et al. (2001), p.56-57

<sup>112</sup> Cf. SCHIPPER/VINCENT (2003), p.101

<sup>113</sup> BALL et al. (2000), p.15

<sup>114</sup> Cf. LEUZ et al. (2003), p.514

Proper accounting usually leads to more volatile cash flows than accruals. In order to gain high earnings quality, Equation (10) is usually smaller than 1 and Equation (11) is negative.<sup>115</sup>

Volatility and smoothness as a measure of earnings quality has some caveats. While Schipper/Vincent (2003) or Ball et al. (2000) see smooth earnings as a sign of quality, there are opponents stating income smoothing as a form of earnings management.<sup>116</sup> With the two explained measures the level of volatility and smoothness can only be determined. The problem is that the result does not indicate whether it is the outcome of high earnings quality or simply earnings management.

Dechow and Schrand (2004) also determine that volatility is "... a natural part of running a business and should be reflected in earnings."<sup>117</sup> They go on that different types of volatility should be considered. Only volatility of cash flows that does not reflect the variation in its underlying business should be smoothed out. However, too much smoothing may mitigate volatility excessively and leads to a decrease in earnings quality.

#### 4.4 Quality of Accruals

Another approach to describe earnings quality is the analysis of the quality of accruals itself. As clarified in Chapter 2, earnings consist of cash flows and accruals in which accruals are additional information gained through accounting.<sup>118</sup> Accruals often contain estimations and judgments which bear the risk of errors. These errors are noise that lowers the quality of the additional information. Quality of accruals is the degree of accruals matching to cash flows.<sup>119</sup>

The most common measure for quality of accruals is developed by Dechow and Dichev (2002). They describe that accruals shift or adjust the recognition of cash flows of the current period, previous periods, or following periods in the financial statements.<sup>120</sup> In other words, accruals have the function to filter volatile cash flows in order to give a more realistic view of a firm's performance. The model of Dechow and Dichev measures how accruals succeed in this function. In order to ease the traceability, the approach only uses working capital accruals, since cash flows related to working capital are typically realized within one year.<sup>121</sup>

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<sup>115</sup> Cf. WAGENHOFER/DÜCKER (2007), p.273

<sup>116</sup> Cf. SHAW (2003), pp.1049-1050; DECHOW/SKINNER (2000), pp.237-241; SCHIPPER/VINCENT (2003), p.101

<sup>117</sup> DECHOW/SCHRAND (2004), p.7

<sup>118</sup> Cf. WAGENHOFER/DÜCKER (2007), p.274

<sup>119</sup> Cf. DECHOW/DICHEV (2002), p.36

<sup>120</sup> Cf. DECHOW/DICHEV (2002), p.37

<sup>121</sup> Cf. DECHOW/DICHEV (2002), p.37

$$\Delta WC_t = \alpha + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \varepsilon_t \quad (12)$$

The equation describes that the change in working capital equals cash flows of past, present and future cash flows plus an error term.<sup>122</sup> The quality of accruals is measured by the standard deviation of this term. A low standard deviation indicates high quality.

Besides the risk of estimation errors there is also the problem of “discretionary” accruals caused by intentional manipulation of financial statements. The approach of Dechow and Dichev does not differentiate between intentional and unintentional estimation errors and it would be difficult to do so. Nevertheless, they argue that both types of error, intended or not, cause low quality in accruals and earnings.<sup>123</sup>

## 4.5 Earnings Management

This term is a very popular related to earnings quality. Nearly all earnings attributes deal with the use of earnings management. Managed earnings or highly managed earnings are usually of lower quality. Anyhow this statement does not lead to the conclusion that the absence of earnings management is a guarantee for high earnings quality. There is a range of other influences on the quality of earnings like for example accounting standards itself.<sup>124</sup> Earnings management has high benefits for a company if it is not discovered or anticipated.<sup>125</sup>

Earnings quality analyses the specific manipulation of accounting figures. Managing earnings distorts information and is bad for earnings quality. Healy and Valen (1999) define “Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers.”<sup>126</sup>

Former chairman of SEC, Arthur Levitt describes in his speech “The numbers game” five major practices of earnings management:<sup>127</sup>

- **“Big bath” charges:** When restructuring a company, large charges may occur and earnings numbers are not met any longer. Companies use this situation and overesti-

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<sup>122</sup> Cf. DECHOW/DICHEV (2002), p.40-41

<sup>123</sup> Cf. DECHOW/DICHEV (2002), p.53

<sup>124</sup> Cf. LO (2008), p.351

<sup>125</sup> Cf. WAGENHOFER/DÜCKER (2007), p.275

<sup>126</sup> HEALY/WAHLEN (1999), p.368

<sup>127</sup> Cf. LEVITT (1998)

mate charges and clean their balance sheet in this way. In other words, they take a big bath. Investors may look beyond a one-time loss and focus on future earnings.

- **Creative acquisition accounting:** Many firms use acquisitions, consolidations, and spin-offs in order to manage earnings. One popular method of “creative” accounting is to define the acquisition price as R&D costs. These amounts can be written off in one period and do not affect future earnings any longer.
- **“Cookie jar reserves”:** Companies overstate liabilities for warranty costs or other unforeseeable eventualities in the good times. In the bad times those accruals are used to smooth earnings out.
- **Materiality:** Some companies misuse the concept of materiality by recording errors with a certain percentage. At review the argument is that the amounts of error are too small to matter. Very often, also small amounts matter, otherwise the firms would not make effort to produce these “errors”.
- **Revenue recognition:** By recognizing revenues before a sale is complete, a company is manipulating the statements by boosting its earnings.

Levitt describes that this accounting “hocus-pocus” is necessary in order to “make the numbers”. These illusions allow businesses to keep pace with business innovations.

Despite everyone knows that earnings management exists, it is difficult to measure it. A big problem is to estimate a company’s real earnings without the effects of earnings management. One common approach is to identify managers’ reporting incentives or conditions in which earnings management is more likely. Related unexpected accruals or accounting method choices are tried to be discovered.<sup>128</sup>

There are different incentives for managers to “make the numbers”. The main reasons are to avoid losses, to report increases in seasonally-adjusted quarterly earnings, and to meet analysts’ expectations.<sup>129</sup> “Investors reward firms whose earnings meet or beat analysts’ estimates.”<sup>130</sup> DeGeorge et al. (1999) find that companies have three possible thresholds which predict discontinuities in earnings.<sup>131</sup>

- **Sustain recent performance:** An important threshold for earnings numbers is the report from one year ago. To beat this benchmark is a main goal to provide evidence for constant growth.

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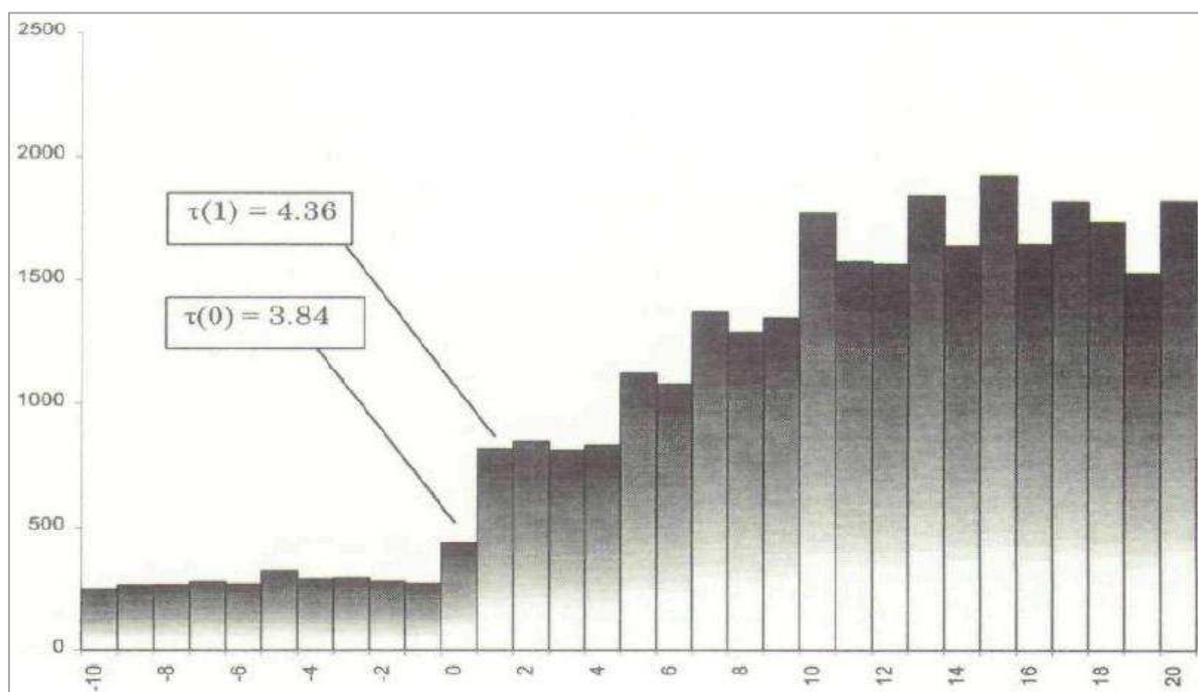
<sup>128</sup> Cf. HEALY/WAHLEN (1999), p.370

<sup>129</sup> DECHOV/SKINNER (2000), p.242

<sup>130</sup> HAYN (2000), p.2

<sup>131</sup> Cf. DEGEORGE et al.(1999), pp.19-22

- **Meet analysts' expectations:** Even if it is close, investors interpret a remaining below the expectations of analysts as a bad sign. It is significant that firms always try to meet or beat the expectations.
- **Report positive profits:** Empirical studies provide evidence that firms have a loss aversion and try to manage earnings from small losses upwards to zero or to small profits. Figure 6 expresses this relation very clearly. Especially in countries with weak investor protection, the presence of small positive earnings is more prevalent.<sup>132</sup>



Source: DEGEORGE et al. (1999), p.22

**Figure 6: Histogram of EPS, exploring the threshold of "positive/zero profits"**

Nevertheless it is hard to distinguish between proper accruals and earnings management. There is neither theoretical nor empirical a benchmark for "true" or correct accrual amounts. An indicator for earnings management is the relation of accruals to cash flow.<sup>133</sup>

$$\frac{ACC_t}{CFO_t} \quad (13)$$

A high outcome of this ratio indicates a high degree of earnings management.<sup>134</sup>

<sup>132</sup> Cf. LEUZ (2003), pp.514-515,525-526

<sup>133</sup> Cf. WAGENHOFER/DÜCKER (2007), p.276

<sup>134</sup> Cf. LEUZ et al. (2003), p.510

An alternative method was developed by Jones (1991) that divides accruals into normal accruals ( $NACC_{i,t}$ ) and discretionary accruals ( $DACC_t$ ).<sup>135</sup>

$$ACC_t = NACC_t + DACC_t \quad (14)$$

The amount of discretionary accruals compared to total assets is an indicator for earnings management. But as already mentioned it is hard to distinguish from legitimate additional information of accounting to cash flows.<sup>136</sup>

## 4.6 Timeliness

Timeliness as measure for earnings quality describes the time passed from an event affecting earnings to the moment of recognition in the financial statements. A quick recognition means higher quality because earnings are more current and imply later news.<sup>137</sup>

To measure timeliness earnings are usually compared to stock returns. Stock return as reference number makes sense because it describes economic performance relevantly. Equation (15) is a reverse regression of earnings on returns.<sup>138</sup>

$$\frac{X_t}{P_{t-1}} = \alpha + \beta R_t + \varepsilon_t \quad (15)$$

It is a reverse regression because earnings  $X_{i,t}$  depend on stock returns  $R_t$ . In order to get the same proportions, earnings  $X_t$  are scaled by equity market value  $P_{t-1}$ . The slope coefficient  $\beta$  and regression coefficient  $R^2$  are functionally related:<sup>139</sup>

$$\beta^2 = R^2 * \frac{\text{var} \frac{X_t}{P_{t-1}}}{\text{var} R_t} \quad (16)$$

Both, the  $R^2$  and the variance ratio are higher for more timely accounting figures and higher earnings quality.

Since accounting is traditionally a conservative discipline, accountants rather anticipate future losses than future profits.<sup>140</sup> Because of the fact that more verifiable information is needed before realizing good news, bad news is recognized faster. In order to not dilute results Chapter 5.2.2 only investigates the timely recognition of losses but not of gains.

<sup>135</sup> Cf. JONES (1991), p.207

<sup>136</sup> Cf. WAGENHOFER/DÜCKER (2007), p.276

<sup>137</sup> Cf. BALL/SHIVAKUMAR (2005), p.84; WAGENHOFER/DÜCKER (2007), p.277

<sup>138</sup> Cf. WAGENHOFER/DÜCKER (2007), p.277; BALL et al. (2000), p.7,8; BASU (1997), pp.11-14; FRANCIS et al. (2004), p.972

<sup>139</sup> Cf. BASU (1997), p.11

<sup>140</sup> Cf. BASU (1997), pp.7,8; WATTS (2003), p.208

Timeliness combined with conservatism (Section 4.7) is also referred to the concept of financial statement “transparency”.<sup>141</sup>

## 4.7 Conservatism

As already mentioned, accounting is a rather conservative discipline. Conservatism is described as the tendency of accountants to reflect bad news in the financial statements more quickly than good news. SFAC No.2 states: “... if two estimates of amounts to be received or paid in the future are about equally likely, conservatism dictates using the less optimistic estimate”.<sup>142</sup> The practice of asymmetric recognition of gains and losses is also referred to the concept of prudence in the IFRS standards. The IFRS Conceptual Framework defines prudence as “...the inclusion of a degree of caution in the exercise of the judgments needed in making the estimates required under conditions of uncertainty, such that assets or income are not overstated and liabilities or expenses are not understated.”<sup>143</sup>

Literature distinguishes between two concepts of conservatism. The first one is news independent and is called unconditional conservatism, meaning that “...aspects of the accounting process determined at the inception of assets and liabilities yield expected unrecorded goodwill”.<sup>144</sup> Conditional conservatism in contrast is news dependent. It happens as already described when bad information influences financial accounting numbers negatively but not in the positive way under good information.<sup>145</sup>

Conservatism is closely related to timeliness and is also measured in a regression with stock returns and earnings.<sup>146</sup> Unlike the regression of Equation (15), this approach divides observations into good news and bad news, based whether return was positive or negative.<sup>147</sup>

$$\frac{X_t}{P_{t-1}} = \alpha_0 + \alpha_1 DR_t + \beta_0 R_t + \beta_1 R_t DR_t + \varepsilon_t \quad (17)$$

The dummy variable  $DR_t$  takes the value 0 for bad news (negative returns) and the value 1 for good news (positive returns). The slope coefficient  $\beta_0$  measures sensitivity towards positive returns and  $\beta_1$  measures the difference in sensitivity of earnings to negative and positive returns. The sum of the slope coefficients  $\beta_0 + \beta_1$  measures the sensitivity towards negative

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<sup>141</sup> Cf. BALL et al. (2000), p.2; FRANCIS et al. (2004), p. 973

<sup>142</sup> FASB SFAC 2.95

<sup>143</sup> IASB FRAMEWORK BC2.20

<sup>144</sup> BEAVER/RAYN (2005), p.269

<sup>145</sup> Cf. BEAVER/RAYN (2005), pp.269,270; BROWN et al. (2006), p.607

<sup>146</sup> Cf. WAGENHOFER/DÜCKER (2007), p.278; FRANCIS et al. (2004), p.973

<sup>147</sup> Cf. BASU (1997), pp.13-14; WAGENHOFER/DÜCKER (2007), p.278

returns. A high value of  $\beta_1$  signals a high degree of conservatism since the coefficient of bad news is higher than for good news. A similar implication is reached by the ratio  $\frac{\beta_1 + \beta_2}{\beta_1}$ .<sup>148</sup>

## 4.8 Value Relevance

Market participants make decisions based on information and expectations. An overall result of all these actions is integrated in the market price. Since these market participants would only use information that is sufficiently relevant and reliable it is interesting to compare market prices with figures of accounting.<sup>149</sup> Value relevance describes the degree of correlation between earnings numbers and information adhered in market prices. "An accounting amount is defined as value relevant if it has a predicted association with equity market values."<sup>150</sup> Since market prices theoretically contain all relevant, available information, it is desirable for earnings to have a high correlation.<sup>151</sup>

An approach to determine value relevance is another regression equation using stock returns and earnings. Equation (18) is basically the inverse equation of the measure of timeliness.<sup>152</sup>

$$R_t = \alpha + \beta \frac{X_t}{P_{t-1}} + \varepsilon_t \quad (18)$$

The equation estimates the association between stock market returns and earnings numbers scaled by equity value. The earnings response coefficient  $\beta$  and the equations  $R^2$  indicate the strength of the association i.e. earnings' value relevance.

An extension offers Ohlson (1995) by adding the book value of equity to the function:<sup>153</sup>

$$R_t = \alpha + \beta_0 \frac{X_t}{P_{t-1}} + \beta_1 \frac{BVE_t}{P_{t-1}} + \varepsilon_t \quad (19)$$

This regression model creates a relationship between stock returns  $R_t$  to earnings  $X_t$  and book value of equity  $BVE_t$  scaled by equity value  $P_{t-1}$ . This equation is being used for the research part in Chapter 5. According to the FASB's Conceptual Framework, value relevance and reliability are the two primary criteria for decision usefulness.<sup>154</sup> SFAC No. 5 states in-

<sup>148</sup> Cf. WAGENHOFER/DÜCKER (2007), p.278; BASU (1997), p.13-14

<sup>149</sup> Cf. WAGENHOFER/EWERT (2007), p. 105

<sup>150</sup> BARTH et al. (2001), p.79

<sup>151</sup> Cf. WAGENHOFER/DÜCKER (2007), p.279; AMIR et al. (1993), p.231; BARTH (2000), pp.16-17

<sup>152</sup> Cf. WAGENHOFER/DÜCKER (2007), p.279; WAGENHOFER/EWERT (2007), p.107-108

<sup>153</sup> Cf. OHLSON (1995), p.669; PAANANEN/LIN (2009), p.41

<sup>154</sup> Cf. BARTH et al. (2001),p.80; FRANCIS et al. (2004),p.972;WAGENHOFER/EWERT (2007), p.105

formation as relevant if it is able “to make a difference” to financial statement users’ decisions and as reliable if it “is represented faithful, verifiable, and neutral”.<sup>155</sup>

An example of Dechow and Schrand (2004) comes to the consequence that relevant information will not be useful if it is not reliable and reliable information will not be useful if it is not relevant. The problem is that there is a trade-off between relevancy and reliability. The example is a company manager who could provide extremely relevant information. Unfortunately such a number is maybe not verifiable and therefore not very reliable. A high quality earnings number simply needs the conformance of both criteria but the relative importance of each factor is hard to identify.<sup>156</sup>

#### 4.8.1 Earnings versus Cash Flows

Dechow (1994) investigates over 30,000 Compustat firm-years from 1964 to 1989. She assumes that earnings with the help of accruals more closely reflect firm performance than realized cash flows can do.<sup>157</sup> She finds results which are consistent with this prediction. Both in short and long term horizons earnings numbers could provide better firm performance measures than cash flow numbers. Moreover, earnings have a higher association with stock returns. Especially in firms experiencing changes in working capital, financing, or investment activities, cash flows have matching and timing problems and are therefore less value relevant.<sup>158</sup>

The researchers Penman and Sougiannis (1998) compare in their study dividend, cash flow, and earnings approaches to equity valuation. All three input variables are specified to the residual income valuation framework.<sup>159</sup> Actual traded prices are compared to intrinsic values calculated.<sup>160</sup> On average 4,192 firms per year are observed over a period from 1973 to 1987. They come to the conclusion that “...equity valuations based on forecasting GAAP accrual earnings and book values have practical advantages over forecasting dividends and cash flows. Accrual accounting has the feature of bringing the future forward in time in accruals and, by the accounting for operating assets, excluding investment expenditures as a charge against cash flow payoffs from operations.”<sup>161</sup> They conclude that this vantage is enabled by the matched expenses of investments against inflows with depreciation.

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<sup>155</sup> Cf. FASB SFAC 5.73-77

<sup>156</sup> Cf. DECHOW/SCHRAND (2004), p.8

<sup>157</sup> Cf. DECHOW (1994), pp.8,15

<sup>158</sup> Cf. DECHOW (1994), p.35

<sup>159</sup> See also Chapter 3.6

<sup>160</sup> Cf. PENMAN/SOUGIANNIS (1998), p.347

<sup>161</sup> PENMAN/SOUGINANNIS (1998), p.376

## 5 The Development of Earnings Quality over Time: The Case of Germany

The following empirical study is based on the paper of Mari Paananen and Henghsiu Lin (2004) who examined the characteristics of accounting amounts using a sample of German companies reporting under IAS during 2000-2002 and IFRS during 2003-2004 and 2004-2006. Different to other studies which compare properties of accounting numbers, this study investigates the impact of IAS revisions and IFRS developments on the quality of the accounting amounts over time. As described in Chapter 2, international accounting standards experienced several revisions and changes with the goal to develop high quality standards.<sup>162</sup> Especially the orientation towards fair value accounting has been a major topic for the IASB. This study inquires how these developments are affecting the quality of accounting. In order to not distort results with different national regulations, such as stock listing requirements or accounting disclosure requirements, the study only uses German companies.<sup>163</sup>

### 5.1 Hypothesis

The study assumes that recent developments in the international accounting standards have led to changes in the quality of financial reporting over time. The question this study wants to answer is whether the accounting quality is higher as a result of recent developments. The goal of the IASB has been the perfection of accounting standards, so the changes in recent years should have improved the quality of earnings. The study tries to identify the quality by measuring earnings smoothing, timely loss recognition and value relevance of accounting amounts.<sup>164</sup>

With an increase in earnings quality, the study expects to see a decrease in earnings smoothing, that is characterized by more variability in change in net income, higher ratio of variability of change in net income to variability of change in cash flows, less negative correlation between accruals and cash flows, and less frequency of small positive net income. Furthermore, with respect to timely recognition of losses, it is expected to see a larger fre-

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<sup>162</sup> Cf. TWEEDIE/HERZ (2010)

<sup>163</sup> Cf. PAANANEN/LIN (2009), p.31-32

<sup>164</sup> Cf. PAANANEN/LIN (2009), p.38

quency of large losses. And finally, in consideration of value relevance, a higher association between stock prices and earnings and book value of equity is expected for development towards higher accounting quality.<sup>165</sup>

## 5.2 Empirical Tests

The period ranges from 2000 to 2006 and is divided into three time periods: the IAS period ranging from 2000-2002, the IFRS voluntary (IFRS<sub>V</sub>) period ranging from 2003-2004, and the IFRS mandatory (IFRS<sub>M</sub>) period ranging from 2005-2006. The number of companies investigated, is depended to pertinence and is ranging from 187 to 448. The study uses three different earnings attributes for evaluation: earnings smoothing, timeliness of loss recognition, and value-relevance.

### 5.2.1 Earnings Smoothing and Volatility

Four measures to determine earnings smoothing are used and described in the sections 4.3 and 4.5. The measures are variability of the change in earnings, the ratio of the variability of the change in earnings to the variability of the change in operating cash flows, the correlation between accruals and cash flows, and the frequency of small positive net income.<sup>166</sup>

The first metric is the variability of the change in earnings scaled by total assets,  $\Delta X$ .<sup>167</sup> To take care of other influential factors than financial reporting system affecting earnings,  $\Delta X$  is regressed on a number of control variables identified by numerous researchers.<sup>168</sup> The variances of the residuals of this regression lead to the estimation:

$$\Delta X_t = \beta_0 + \beta_1 LEV_t + \beta_2 Growth_t + \beta_3 Eissue_t + \beta_4 Dissue_t + \beta_5 Turn_{i,t} + \beta_6 Size_t + \beta_7 CFO_t + \beta_8 AUD_t + \beta_9 NUMEX_t + \beta_{10} XLIST_t + \beta_{11} FF_t + \varepsilon_t \quad (20)$$

“where:

- LEV = the total liabilities divided by shareholders' equity;
- GROWTH = the percentage of change in sales;
- Eissue = the percentage change in common shareholders' equity;
- Dissue = the percentage change in total liabilities;
- Turn = sales divided by total assets;
- Size = the natural log of total assets;

<sup>165</sup> Cf. PAANANEN/LIN (2009), p.38

<sup>166</sup> Cf. LANG (2006) pp.261-262,270-280; BARTH (2008) pp.481-485

<sup>167</sup> Cf. LANG et al. (2006) p.261; BARTH et al. (2008) p.481-482; PAANANEN/LIN (2009) p.39

<sup>168</sup> Cf. ASHBAUGH (2001) p.425; BARTH et al. (2008) p.482; LANG et al. (2003) p.371; LANG et al. (2006) p.261; PAGANO et al. (2002) p.2682

- CFO = the cash flow from operating activities scaled by total assets;
- AUD = a dummy variable taking the value of 1 if the firm's auditor is PwC, KPMG, Arthur Andersen, E&Y, or D&T, and 0 otherwise;
- NUMEX = the number of stock exchanges on which a firm's stock is listed;
- XLIST = a dummy variable taking the value of 1 if the firm is listed on a U.S. stock exchange (the U.S. not being the primary exchange), and 0 otherwise; and
- FF = the free float measured as the average number of shares traded on the last day of the month during the fiscal year divided by number of common shares outstanding at the fiscal year end."<sup>169</sup>

A two-tailed F-test is used to compare the variances of the residuals of the regression for each time period.

The second earnings smoothing metric is the ratio of variability of the change in earnings to the variability of the change in cash flows,  $\Delta X/\Delta CFO$ . Like the change in earnings, the change in cash flows is likely to be sensitive to different factors and is therefore approached by a regression similar to Equation (20) but with  $\Delta CFO$  as the dependent variable.<sup>170</sup> Like  $\Delta X$ ,  $\Delta CF$  is scaled by total assets. Different aspects and an interpretation of this measure are described in chapter 4.3 "Volatility and Smoothness". A rank sum test is used to compare the different outcomes of this metric.

The third measure is the Spearman correlation between accruals and cash flows,  $\rho(\Delta ACC_t, \Delta CFO_t)$ <sup>171</sup>. Similar to Equation (10), a separate regression of accruals and cash flows is made. The cash flow part as a control variable is excluded from this regression. For the comparisons of the residuals from the regressions for  $\Delta ACC$  and  $\Delta CFO$  over the different periods, a squared correlation test is being applied.<sup>172</sup>

The incentives to report positive earnings numbers are already discussed in section 4.5. The appearance of managing towards positive earnings is measured with the coefficient on small positive net income, SPO.<sup>173</sup> SPO is used as another control variable of Equations (21) and (22) for the calculation of  $IAS(0,1)_t$  and  $IFRS(0,1)_t$ . The test uses two comparisons. One is IAS period versus  $IFRS_V$  period, the other one is  $IFRS_V$  to  $IFRS_M$  period.

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<sup>169</sup> PAANANEN/LIN (2009) p.39

<sup>170</sup> Cf. BARTH et al. (2008) pp.483-484; LANG et al. (2006) p.262; PAANANEN/LIN (2009) p.40

<sup>171</sup> Cf. BARTH et al. (2008) p.484; PAANANEN/LIN (2009) p.40

<sup>172</sup> Cf. CRAMER (1989) pp.262-265

<sup>173</sup> Cf. BARTH et al. (2008) p.484; LANG et al. (2006) p.262; PAANANEN/LIN (2009) p.40-41;

$$IAS(0,1)_t = \beta_0 + \beta_1 SPO_t + \beta_2 LEV_t + \beta_3 Growth_t + \beta_4 Eissue_t + \beta_5 Dissue_t + \beta_6 Turn_t + \beta_7 Size_t + \beta_8 CFO_t + \beta_9 AUD_t + \beta_{10} NUMEX_{i,t} + \beta_{11} XLIST_t + \beta_{12} FF_t + \varepsilon_t \quad (21)$$

$$IFRS(0,1)_t = \beta_0 + \beta_1 SPO_t + \beta_2 LEV_t + \beta_3 Growth_t + \beta_4 Eissue_t + \beta_5 Dissue_t + \beta_6 Turn_t + \beta_7 Size_t + \beta_8 CFO_t + \beta_9 AUD_t + \beta_{10} NUMEX_t + \beta_{11} XLIST_t + \beta_{12} FF_t + \varepsilon_t \quad (22)$$

The binary variable  $IAS(0,1)$  takes the value of one for the IAS and zero for the IFRS<sub>V</sub> period; variable  $IFRS(0,1)$  takes the value one for the IFRS<sub>V</sub> and zero for the IFRS<sub>M</sub> period.  $SPO$  is an indicator variable taking 1 if net income is between 0 and 0.01.<sup>174</sup> A negative coefficient in Equation (21) indicates that firms in the IFRS<sub>V</sub> period manage their earnings more frequently towards small positive performances than firms in the IAS period. The same statement applies to Equation (22).

### 5.2.2 Timeliness

The timeliness of loss recognition is examined. A similar equation to Equations (21) and (22) is used to estimate the measure of timely recognition whereat  $SPO$  is replaced by  $LNEG$ .<sup>175</sup>

$$IAS(0,1)_t = \beta_0 + \beta_1 LNEG_t + \beta_2 LEV_t + \beta_3 Growth_t + \beta_4 Eissue_t + \beta_5 Dissue_t + \beta_6 Turn_t + \beta_7 Size_t + \beta_8 CFO_t + \beta_9 AUD_t + \beta_{10} NUMEX_t + \beta_{11} XLIST_t + \beta_{12} FF_t + \varepsilon_t \quad (23)$$

$$IFRS(0,1)_t = \beta_0 + \beta_1 LNEG_t + \beta_2 LEV_t + \beta_3 Growth_t + \beta_4 Eissue_t + \beta_5 Dissue_t + \beta_6 Turn_t + \beta_7 Size_t + \beta_8 CFO_t + \beta_9 AUD_t + \beta_{10} NUMEX_{i,t} + \beta_{11} XLIST_t + \beta_{12} FF_t + \varepsilon_t \quad (24)$$

$LNEG$  is another dummy variable taking either the value of 1 when annual earnings scaled by total assets are less than -0.2, and 0 otherwise. The coefficient  $\beta_1$  indicates the quality of timely recognition of large losses. A positive value indicates that large losses were more frequently recognized in previous period than in the actual one. For example, a positive coefficient on  $LNEG$  in Equation (23) indicates more actual loss recognition in the IAS than in the IFRS<sub>V</sub> period.

The second measure for timely loss recognition is the reverse regression of Basu (1997), described in Equation (17). In order to focus on timeliness of losses, this model differs from the measure in Section 4.6, by dividing observations into good news and bad news, based on whether return was positive or negative. The timeliness of losses is measured by the coefficient  $\alpha_1$ . A larger coefficient on bad news earnings indicates better timely loss recognition.

<sup>174</sup> Cf. LANG et al. (2006) pp.269-273

<sup>175</sup> Cf. PAANANEN/LIN (2009), p.41

### 5.2.3 Value Relevance

As described in Chapter 4.8 value relevance of the study is determined with the regression of Equation (19). In a first test, the regression  $R^2$  between stock prices and earnings numbers is examined. In a next step the reverse regression<sup>176</sup> with earnings as the dependent variable is operated. In order to investigate differences in timely recognition, the sample is divided into positive and negative return observations. Since losses are recognized more timely than gains it is expected that information disclosed in bad times is more relevant.<sup>177</sup>

## 5.3 Results

Table 3 shows the results of the four measures of earnings smoothing. The variability of  $\Delta X$  and variability of  $\Delta X$  over  $\Delta CFO$  shows an increase from IAS to IFRS<sub>voluntary</sub> period and an decrease from IFRS<sub>voluntary</sub> to IFRS<sub>mandatory</sub> period. In other words, the outcome of these tests suggest that earnings smoothing first decreased when IFRS were introduced but later when IFRS got mandatory earnings smoothing increased significantly again. In accordance with Section 4.5 these tests indicate clearly increased earnings management from the IFRS voluntary to the IFRS mandatory period. The correlation between the residuals from the regressions on accruals and cash flows shows an increase in negative correlation, suggesting more earnings management after the introduction of IFRS. Finally, the coefficients of small positive net income did not show any significant differences across the three periods.

**Table 3: Panel A, Earnings smoothing**

	IAS n = 187	IFRS <sub>V</sub> n = 204	IFRS <sub>M</sub> n = 448
Variability of $\Delta X^*$	0.038	0.048***	0.018***
Variability of $\Delta X^*$ over $\Delta CFO^*$	3.950	4.697**	1.840**
Correlation of ACC* and CFO*	0.083	-0.048**	-0.049
Small positive net income SPO		-0.273	0.125

\*, \*\*, \*\*\* Significantly different between each category at 0.01, 0.05, and 0.10, respectively (two-tailed)  
#, ##, ### Significantly different from 0 at 0.01, 0.05, and 0.10, respectively (two-tailed)

Source: PAANANEN/LIN (2009), p.47

The results in Table 4 show a decrease in the timely recognition of large losses. The regression coefficient of bad news first indicates an increase in timely recognition of losses from IAS to IFRS<sub>V</sub> period but from IFRS voluntary to mandatory period the coefficient rises again, indicating a decrease in earnings quality.

<sup>176</sup> Cf. BASU (1997), pp.11-14

<sup>177</sup> Cf. PAANANEN/LIN (2009), p.42

**Table 4: Panel B, timely loss recognition**

	IAS n = 187	IFRS <sub>V</sub> n = 204	IFRS <sub>M</sub> n = 448
Large negative NI		0.715###	0.565##
Basu regression of return* dummy coefficient	0.003###	0.008***###	0.004***###

Source: PAANANEN/LIN (2009), p.47

The results of the value relevance test are presented in Table 5 and show the same pattern as the two previous tests. The overall R<sup>2</sup> of the model is 0.44 in the IAS period, 0.09 in the voluntary IFRS period, and 0.19 in the mandatory period, suggesting a significant lower usefulness of accounting numbers under IFRS. The R<sup>2</sup> of the reverse regression shows an increase from IAS to IFRS voluntary period from 0.19 to 0.28. Contrary to expectations, the value of R<sup>2</sup> goes down to 0.16 in the IFRS mandatory period, indicating less association between earnings and returns. Observing only bad news discovers the same outcome; after a rise in value relevance from IAS to IFRS voluntary period from 0.13 to 0.35, R<sup>2</sup> decreases to the value of 0.11 thus the value relevance.

**Table 5: Panel C, Association of stock prices and returns with accounting data**

	IAS n = 187	IFRS <sub>V</sub> n = 204	IFRS <sub>M</sub> n = 448
Price	0.442	0.088***	0.191**
Return regression: pooling good news and bad news ob- servations	0.194	0.283*	0.155
Basu good news	0.026	0.022	0.013
Basu bad news	0.129	0.345**	0.109**

Source: PAANANEN/LIN (2009), p.47

Summing up the three different measures of earnings quality used in this test, the results provide a consistent view of the development of international accounting standards over time in the period from 2000 to 2006. The tests of earnings smoothing, timely loss recognition, and value relevance indicate an increase in earnings quality between the IAS period and the IFRS voluntary period, but a decrease between IFRS voluntary period and IFRS mandatory period. This is a surprise and against the assumed expectations of the study.

## 5.4 Biased Sample Selection

The reason for increase in quality from IAS to IFRS voluntary period and a decrease in quality from IFRS voluntary to IFRS mandatory period could be that only those companies opted voluntarily to IFRS who had some incentive. It was probably for some industries of more interest than for others. When IFRS was mandatory for all, the quality decreased because some companies who did not have benefit had to change too.

An explanation for opting to IFRS voluntary is explained especially for the case of Germany. Germany has a pretty liquid capital market. There is enough money for large and well established companies to raise money in Germany's capital market and therefore it is sufficient to report under German GAAP. On the other side, small and young companies, working in information technology have probably more difficulties to raise money in Germany and try to finance themselves with money from international markets. These companies had incentives to opt to IFRS already in the voluntary period.

To avoid that the sample selection is biased, the study uses sensitivity analysis and uses different sub samples. One sample uses for example only companies with observations in all periods. The result still remains the same. This procedure strengthens prove that accounting quality has worsened over time.

## 6 The Influence of Matching on Earnings Quality

Another influence affecting earnings quality is the concept of matching. A study of Dichev and Tang (2008) describes the influence of matching, especially poor matching, on earnings quality over four decades from 1967 to 2003. In view of the fact that matching, or rather poor matching, does arise for several reasons and not only for accounting standards is interesting for different aspects. At this point it is relevant to consider this study that investigates properties of accounting earnings not only in the context of accounting standard setting. This study goes beyond Paananen and Lin (2009) who hold exclusively standard setters liable for the decrease of earnings quality.

### 6.1 Definition of Matching

The research and discussion about matching has a long and old history in accounting. Paton and Littleton (1940) describe matching as “the principal concern” and “the fundamental problem” of accounting.<sup>178</sup> FASB’s conceptual framework describes matching as the “... simultaneous or combined recognition of costs and revenues that result directly and jointly from the same transactions or other events.”<sup>179</sup>

In the last twenty to thirty years, matching as a guiding principle in accounting lost in importance. In particular since the 1990s, standard setters like FASB evolved a more balance-sheet-based point of view. The determination of income became more and more a resultant of assets and liabilities rather than from revenues and matched expenses.<sup>180</sup> Developments of IAS 36, IAS 38, IFRS 3 using fair value accounting as described in Section 2.3 are recent examples of a prevalent balance sheet perspective. These current developments and philosophy indicate that earnings get “...divorced from their classic role as a gauge of long-term value looks highly probable in the next 30 to 50 years.”<sup>181</sup>

In recent years more interest in studies of matching in the form of research of earnings quality have been going on. So is conservatism in earnings (Section 4.7) nothing else but a spe-

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<sup>178</sup> Cf. Paton, W.A./Littleton, A.C. (1940): An Introduction to Corporate Accounting Standards. Sarasota, FL: American Accounting Association, quoted from: DICHEV/TANG (2008), p.1431

<sup>179</sup> FASB SFAC 6.146

<sup>180</sup> Cf. Storey, R.K./Storey, S.(1998): The Framework of Financial Accounting Concepts and Standards (Special Report). Norwalk, CT: Financial Accounting Standard Board, quoted from: DICHEV/TANG, p.1431

<sup>181</sup> DICHEV/TANG (2008), pp.1426-1427

cial form of poor matching. Also earnings persistence or timeliness is strongly related to the concept of matching.

FASB notes in its concepts that costs are differently related to revenues of periods.<sup>182</sup> An example for a direct match is cost of goods sold which is directly and unmistakably matched to associated revenues. Many expenses like administrative salaries, insurance, or depreciation are recognized during the period in which cash is spent, liabilities are incurred, or related benefits are expected to provide benefits. If expenses cannot be matched with revenues in a certain period, like most research and development costs or advertising, an immediate expense is the consequence. Dichev and Tang describe and analyze two different forms of matching, perfect matching and poor matching.

### 6.1.1 Perfect Matching

The state of perfect matching is prevailing when “...all relevant expenses are matched against the associated revenue.”<sup>183</sup> This is possible when firms’ costs and sales are all traceable, for example costs are only cost of goods sold. Dichev and Tang describe a firm with perfect matching by following relations:<sup>184</sup>

$$X_t^* = Rev_t^* - Exp_t^* \quad (25)$$

$$X_t^* = X_{CC} + \beta_1^*(E_{t-1}^* - X_{CC}) + \varepsilon_t \quad (26)$$

Equation (25) describes the relationship between earnings is the residual of revenues minus expenses. The outcome  $X_t^*$  is earnings under perfect matching, in other words “economic performance”. The asterisk (\*) indicates an accounting variable followed from perfect matching.  $X_{CC}$  in Relation (26) indicates the long-run mean of a company’s earnings and is generated by the firm’s cost of equity capital. The formula describes that earnings tend to gravitate towards the long-run mean of earnings. Deviations in earnings all decrement over time and are finally fully compensated. What remains is  $\varepsilon_t$  describing volatilities in the firms’ business economic environment. Identifying  $X_{CC}$  as a constant and reformulation of Equation (26) leads to  $X_t^* = \beta_0^* + \beta_1^*X_{t-1}^* + \varepsilon_t$ . Using recursive substitution and taking the variance of  $X_t^*$  yields to the equation:<sup>185</sup>

$$Var(X_t^*) = Var(\varepsilon) + (1 + \beta_1^{*2} + \beta_1^{*4}) \quad (27)$$

<sup>182</sup> Cf. FASB SFAC 5.85-87; FASB SFAC 6.147-149

<sup>183</sup> DICHEV/TANG (2008), p.1427

<sup>184</sup> Cf. DICHEV/TANG (2008), p.1427

<sup>185</sup> Cf. DICHEV/TANG (2008), p.1428

By taking the variance, the link between economic volatility and volatility of earnings is perfectly illustrated. Expression (27) shows that perfect matched earnings volatility is exclusively caused by economic volatility.

### 6.1.2 Poor Matching

Poor matching is deviating from perfect matching for a number of reasons.<sup>186</sup> One reason is indeed accounting rules. For example costs of research and development are usually expensed immediately even when they are traceable.<sup>187</sup> Another factor of poor matching is earnings management as described in Section 4.5. The third point is unavoidable business factors. Examples are fixed costs or poor traceability of costs.<sup>188</sup>

Dichev and Tang describe expenses under poor matching  $Exp_t$  as perfectly matched expenses  $Exp_t^*$  plus a random variable  $v_t$ .<sup>189</sup>

$$Exp_t = Exp_t^* + v_t \quad (28)$$

The variable  $v_t$  is a total of random variables from different periods ( $v_t = \tau_t - \tau_{t-1}$ ) which are not correlated with matched revenues or expenses. This means that  $v_t$  is a total of mismatched expenses of different years that acts as “noise” in earnings numbers. Since mismatched expenses must reverse at another point of time, the sum of expenses is expected to converge in the long run. It is also to say that  $\tau_t$  can be both positive and negative, suggesting either over- or under-accrual of expenses. The model of Equation (28) is a simplification since it is assumed that all mismatched expenses are cleared out within one period.

## 6.2 Hypothesis

Dichev and Tang assume that matching has become worse over time and identify two strong reasons for this trend. One reason is the evolution of standard-setting that deliberates a more balance-sheet-based accounting. The other factor is changes of characteristics in the real economy. There is a general trend towards more fixed than variable costs, more research and development activities, more complicated production, marketing, and financial products.<sup>190</sup> In Section 6.4 these two sources of poor matching are further investigated.

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<sup>186</sup> Cf. DICHEV/TANG (2008), p.1427

<sup>187</sup> Cf. IASB IAS 38.57

<sup>188</sup> Cf. IASB IAS 37.14,49,83; FASB SFAC 6.175

<sup>189</sup> Cf. DICHEV/TANG (2008), p.1429

<sup>190</sup> Cf. DICHEV/TANG (2008), p.1432

Based on the assumption that matching has become weaker over time, the developments lead to the following hypotheses:<sup>191</sup>

- The contemporaneous correlation between revenues and expenses is lessened by poor matching. The influence of poor matching “scatters” expenses across different periods which are not associated with the revenues.<sup>192</sup>
- Poor matching has negative influence on volatility of earnings, hence on smoothness of earnings. The noise, generated by mismatched expenses leads to additional volatility in earnings.
- Persistence of earnings is decreasing due to the effects of poor matching. The slope coefficient  $\beta_1^*$  of perfect matching in Relation (25) is influenced by numerous confounders ( $\tau_t, \tau_{t-1}, \dots$ ) with negative autocorrelation<sup>193</sup> in changes.
- Over a longer time period, the impact of poor matching loses in influence and is diminishing. The reason for that assumption is that “accounting is self-correcting” and therefore errors are resolved over longer timely range of vision.

### 6.3 Empirical Tests and Results

The sample for the tests uses yearly data of the biggest 1000 companies from the Compustat database for the period of 1967 to 2003. Since companies fluctuate due to various forms of failure and exit, the sample uses the top 1000 firms in terms of total assets. Earnings, revenues, and expenses are taken from the database and prepared by the researchers. In order to resolve scale issues, all data is scaled by total assets. The volatilities of the data is calculated by taking the standard deviation of the scaled variable and smoothed over five years. The earnings persistence is discovered by performing a regression between current earnings and the five previous periods' earnings on a cross-sectional basis. The slope coefficients of these regressions are each year's earnings persistence. The correlation between revenues and expenses is the correlation of their scaled variable, smoothed over five years.

The first prediction, saying that poor matching leads to a weaker correlation of revenues and contemporaneous expenses, is investigated by examining the temporal behavior of coefficients in a regression analysis. Regressions are being made with revenues on one-year-back, present, and one-year-forward expenses. In this approach both contemporaneous and non-contemporaneous expenses are examined.

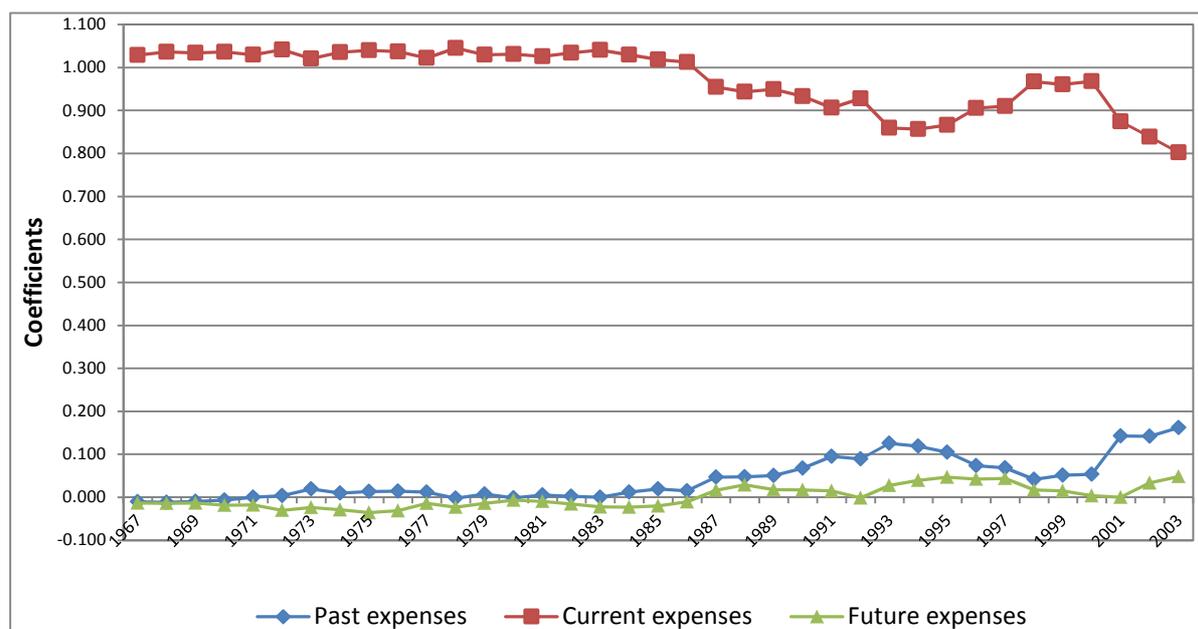
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<sup>191</sup> Cf. DICHEV/TANG (2008), p.1429-1431

<sup>192</sup> Cf. SIVAKUMAR/WAYMIRE (2003), pp.406-409

<sup>193</sup> Cf. BRACEWELL (2000), pp.40-45

The results in Figure 7 are smoothed over five years and demonstrate the decrease in correlation between revenues and contemporaneous expenses. The plot shows high and consistent values of the coefficient of present expenses in begin but over time it is gradually decreasing. Inversely, the non-contemporaneous coefficients are beginning with constant values around zero and increase significantly. Especially the coefficient for past expenses is changing dramatically. This finding corresponds with evidence of increasing conservatism over time.<sup>194</sup>



Source: DICHEV/TANG (2008), p.1438 (modified)

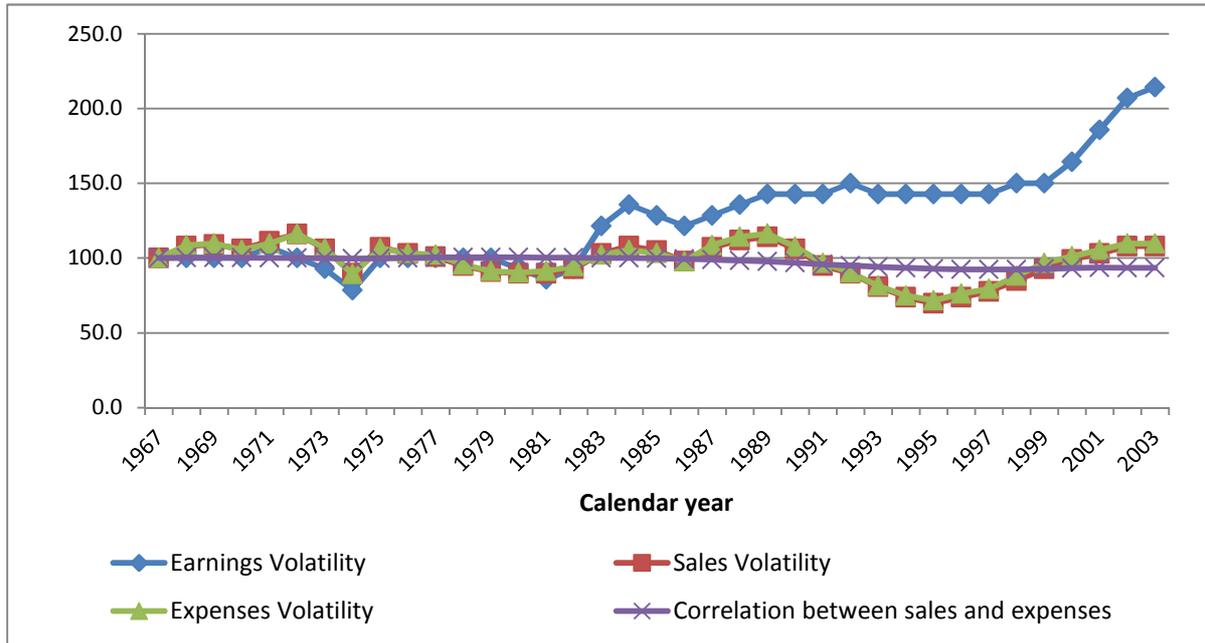
**Figure 7: Coefficients in regression of revenues on past, current, and future expenses**

The testing of the influence of matching on earnings volatility is an analysis of the volatility of the underlying business fundamentals. For that purpose volatility of earnings is compared with volatility of the according revenues and expenses. As stated before, the match between these variables should be high because earnings are equal to revenues minus expenses. Also, the correlation between the volatilities between revenues and expenses is analyzed.

Figure 8 shows the outcome of the volatility analysis. In order to enhance comparability, all values are smoothed over 5 years and normalized to a beginning value of 100. The results show a statistical significant increase of earnings volatility over these four decades. On the other hand there is no increase in the volatilities of revenues and expenses. The test of the correlation between the volatilities between revenues and expenses shows a significant decrease too. These results suggest that the volatility of earnings is increasing due to the fact

<sup>194</sup> GIVOLY/HAYN (2000), p.317

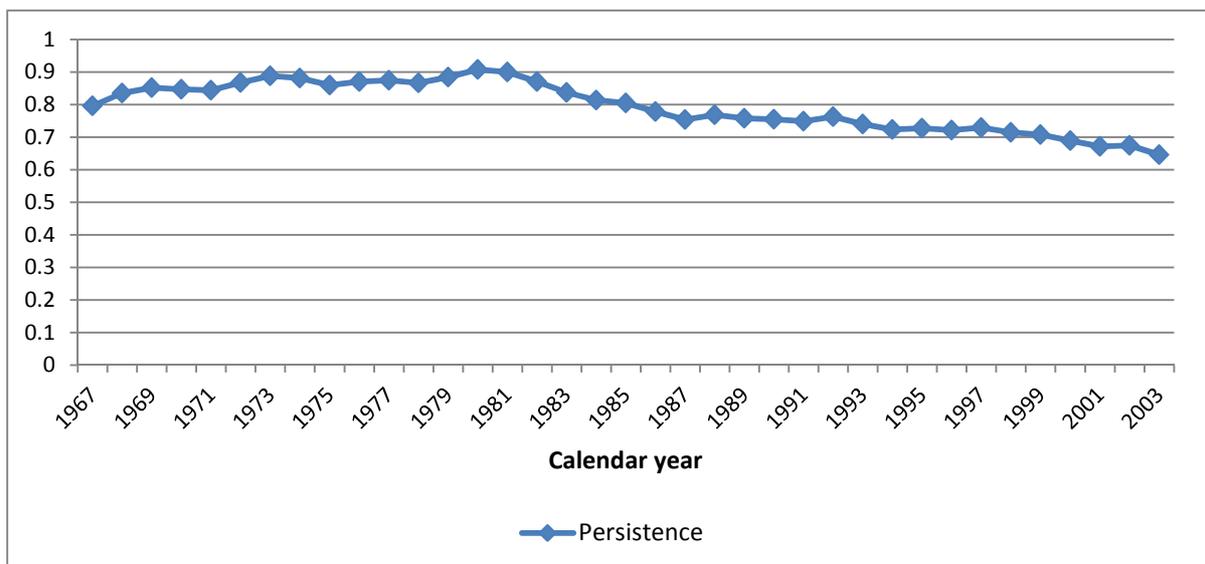
of poor matching. These results also go along with findings of increasing conservatism “where the expenses precede the associated revenues”.<sup>195</sup>



Source: DICHEV/TANG (2008), p.1442 (modified)

**Figure 8: Earnings volatility and its components over time**

The analysis of persistence indicates similar results. As shown in Figure 9, persistence declined significantly over time. This outcome supports the hypothesis that poor matching has negative impact on quality of earnings.



Source: DICHEV/TANG (2008), p.1444 (modified)

**Figure 9: Earnings persistence over time**

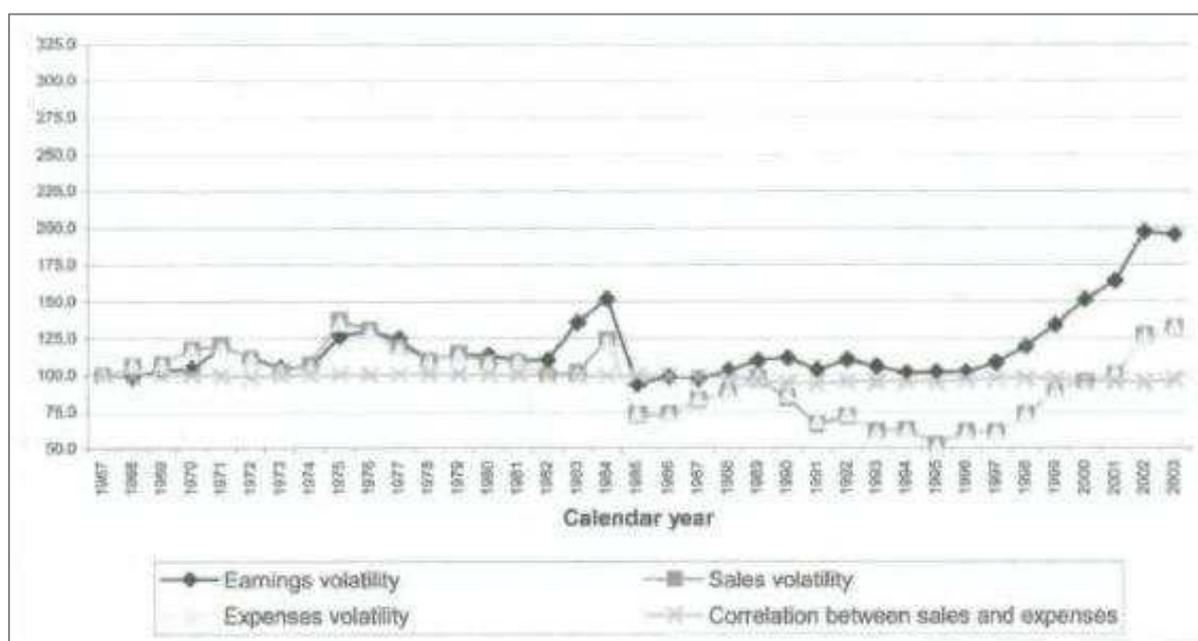
<sup>195</sup> GIVOLY/HAYN (2000), p.317

## 6.4 Sources of Poor Matching: Standard Setting vs. Real Economy

As already identified, among other reasons, the two main sources of poor matching are the evolution of accounting standard setting and developments in real economy. In order to identify some evidence on the differential role of these two sources, Dichev and Tang<sup>196</sup> provide an additional test. This test tries to clarify the relative importance of accounting and economic causes of poor matching.

The idea of this check is to re-run the main tests with taking different samples of different accrual quality. The test tries to identify differences of matching quality by taking a subsample of high quality accruals and a subsample of low quality accruals.

For the identification of these samples, the approach of Dechow and Dichev (2002), explained in Section 4.4, helps to identify the quality of the samples' accruals. The sample is divided into a group with high quality accruals and one with low quality accruals.

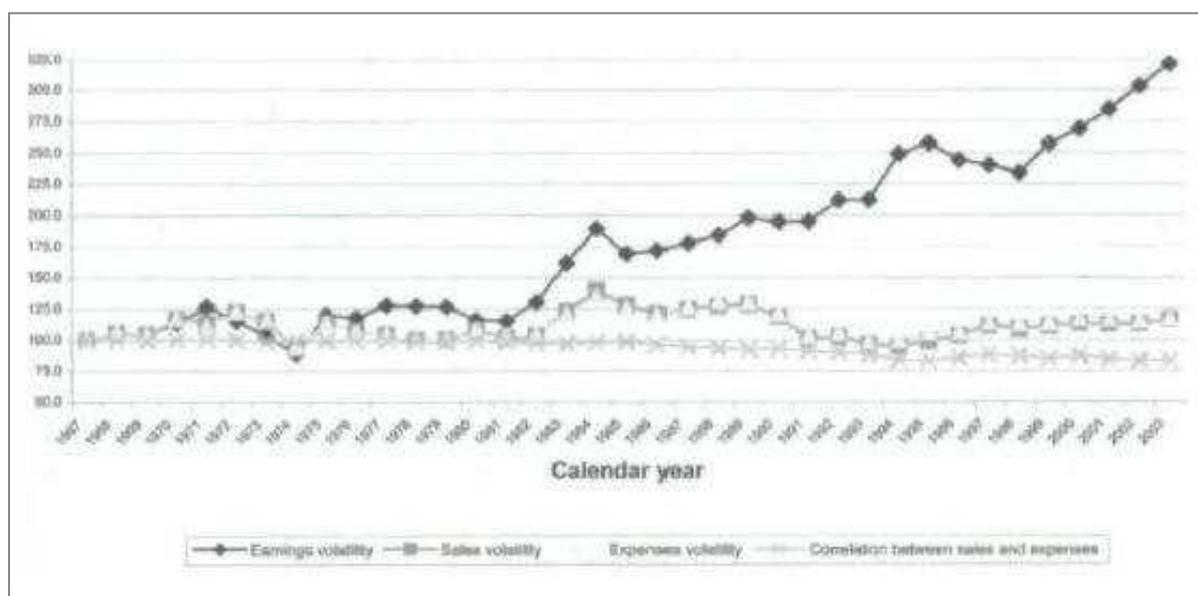


Source: DICHEV/TANG (2008), p.1454

Figure 10: Earnings volatility and its components over time (HIGH ACCRUAL QUALITY)

<sup>196</sup> Cf. DICHEV/TANG (2008), p.1451

As illustrated in Figures Figure 10 and Figure 11, there are clear differences in the two sub-samples. While the earnings volatility of high accrual quality starts rather late and is more moderate over time, the earnings volatility of low accrual quality starts more early and increases dramatically. This finding provides clear evidence that the accounting-related factors are the primary determinant of poor matching; the real economy changes are secondary.



Source: DICHEV/TANG (2008), p.1454

**Figure 11: Earnings volatility and its components over time (LOW ACCRUAL QUALITY)**

Despite the provided evidence of Dichev and Tang (2008) and Paanaen and Lin (2009), the fact must be added that declining quality in earnings or poor matching is not only the fault of decisions of standard setters. Most developments in the standards are not only pushed by standard setters but it is also just an answer of predominant economic environment. An increased role of technology and a proliferation of financial operations and events are examples of business factors that are difficult to display in a classical financial reporting system. In order to keep up with these developments, standard setters have had to adapt themselves to these changes.

## 7 Conclusion

With its increasing popularity the International Financial Reporting Standards (IFRS) experienced a lot of developments. Especially in the last decade a lot of countries adopted or allowed IFRSs and this brought a lot of changes with it. Moreover, IFRS standard setter IASB (International Accounting Standard Board) has put an emphasis on a balance sheet perspective and fair value accounting. Numerous revisions and changes of standards lead to the assumption that also changes in earnings quality have been taking place. Since the goal of the IASB is a single set of high quality standards it is supposed that earnings quality increased with such movements in standard setting.

In the study of Paananen and Lin (2009) a sample of German companies reporting under international accounting standards from 2000 to 2006 is examined. The companies were reporting voluntary under International Accounting Standards (IAS) during 2000-2002, voluntary under IFRS during 2003-2004, and mandatory under IFRS during 2005-2006. Especially, changes in earnings quality are being investigated. Among a range of earnings quality metrics, three measures are used. These measures are smoothness and volatility, timeliness, and value relevance.

Contrary to expectations, the results of the study are suggesting a decrease in the quality of earnings over time. Initially, the quality increased slightly from the IAS to the IFRS voluntary period but worsened significantly in the IFRS mandatory period. The value relevance of earnings and book value of equity decreased, earnings smoothing increased, and there is less timely recognition of losses over time.

The study points out that the decrease of earnings quality is mainly driven by changes in accounting standards and not by new adopters in 2005. There is suspicion that the quality in earnings decreased because only those companies opted voluntarily to IFRS who had some incentive, the others followed when it was mandatory. Before, companies could choose whether they report under IFRS or not. This fact is anticipated by the study and uses matched samples ignoring new adopters. The outcome remains the same which strengthens the argument of decreasing accounting standards quality.

A further study of Dichev and Tang (2008) investigates the relationship between matching and accounting numbers, especially earnings quality over a period of 40 years. Poor matching acts as "noise" in earnings numbers; it decreases the contemporaneous correlation be-

tween costs and revenues, increases the volatility of earnings, and decreases the persistence of earnings.

The study finds that matching has become worse over time. A significant decrease in correlation between expenses and associated revenues is found. Differently to Paananen and Lin (2009), Dichev and Tang (2008) identify other influential factors on earnings quality than solely accounting standards. Not only the evolution of accounting rules leads to poor matching but also the nature of the real economy. Business practices became more diverse, more volatile, and more international, especially in the last few decades. They indicate that the increase of such business factors is inhering uncertainty in future benefits that decreases the quality in accounting and earnings.

This leads to the conclusion that the decreasing quality of earnings is not solely driven by accounting standard setters like the IASB. Poor matching is the outcome of both, accounting standard setters and economic environment. In certain cases the accounting standards only reflect economic conditions. The decrease of earnings quality has been partly an inevitable process from the perspective of accounting standard setters.

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