

ADVANCING VALUE-RELEVANCE STUDIES ON NON-FINANCIAL INFORMATION: A COMPLEMENTARY APPROACH

Thomas Berndt^{*}, Céline Bilolo^{**} and Ludwig Müller^{***}

Abstract

This study investigates the value-relevance of non-financial information published in the narrative part of SPI annual reports. Our research contributes to the issue by introducing a new and objective approach for measuring non-financial information: based on a combination of content and factorial analysis, we quantify the extent of profitability and sustainability related information and find evidence for a positive relation to share price. The measurement aims to take both, quantity and variety of expressions into account and proves that this is of investors' interest. Furthermore, consistent with prior studies based on Ohlson's (1995) value-relevance model, we also consider financial statement data and find that net income and book value of equity are positively related to market value. Our findings implicate that both, numerical and non-numerical information influence investors' perceptions and are therefore, crucial to be included in annual reports as the major communication tool.

Keywords: Corporate Reporting, Integrated Reporting, Sustainability, Non-financial Information, Content Analysis, Value-relevance

JEL Classification: M41

^{*} Professor of Accounting and Director of the Institute of Accounting, Controlling and Auditing, University of St.Gallen, E-Mail: thomas.berndt@unisg.ch

^{**} Doctoral Candidate at the University of St.Gallen, Institute of Accounting, Controlling and Auditing, University of St.Gallen, Tigerbergstrasse 9, CH-9000 St. Gallen, Switzerland, E-Mail: celine.bilolo@unisg.ch; Tel.: +41 71 224 7681

^{***} Doctoral Candidate at the University of St.Gallen, Institute of Accounting, Controlling and Auditing, University of St.Gallen, Tigerbergstrasse 9, CH-9000 St. Gallen, Switzerland, E-Mail: ludwig.mueller@unisg.ch; Tel.: +41 71 224 7682

1. INTRODUCTION

Empirical research on corporate disclosure has been fundamentally guided in the light of information asymmetry and agency problems between managers and outside investors as described by Fama and Jensen (1983, p. 305) as well as Jensen and Meckling (1976, p. 308). Regulators, standard setters and other capital market intermediaries are considered as an appropriate solution to solve these problems, pushing managers to disclose their private information (Healy and Palepu, 2001, p. 406, 408). Financial disclosure, including transparent and reliable information about the totality, timing and uncertainty of a company's future in- and outflows, should enable investors to allocate their capital efficiently (Berndt and Leibfried, 2007, p. 397).

Regarding value-relevance of corporate disclosure, prior research has generally focused on financial statement information and uses various concepts and definitions, most of all referring to the association of any reported information with a financial measure, such as stock price. In this context, Francis and Schipper (1999, p. 327) conceptualize value-relevance as "*the ability of financial statement information to capture or summarize information, regardless of source, that affects share values*". Among others, earnings and book values are widely recognized in research as such value-relevant financial information (Healy and Palepu, 2001, p. 406).

However, towards the end of the 20th century, scholars have increasingly expressed their concerns regarding the content of traditional reporting and explained a lack of value-relevance in their findings by unreported intangible assets (Collins et al., 1997; Amir and Lev, 1996; Lev and Zarowin, 1999; Wallman, 1995). As Francis and Schipper (1999, p. 323) further conclude, it is argued that traditional reporting "*does not appropriately recognize and measure the economic assets deployed to create shareholder value*" and further add that "*this situation might result either because accounting standards and practices have remained stagnant while business has changed, or because accounting standards and practices have changed in ways that diverge from providing value-relevant information, or both*".

Since then, different attempts have been made to find evidence for the value-relevance of intangibles. However, we find that most of these studies focus on a narrow range of financial or easily quantifiable information, as, for example, annual expenditures on R&D (Sougiannis, 1994; Aboody and Lev, 1998; Sha et al., 2008), purchased goodwill (Jennings et al., 1996; Kallapur and Kwan, 2004; Chambers, 2007) or the number of scientists (Darby et al., 1999) and patents (Greenhalgh and Rogers, 2006; Bessen, 2007; Hall et al., 2005).

At the same time, we recognize two major developments of non-financial corporate reporting practices. First, in addition to the annual report, sustainability and corporate social responsibility (CSR) reports have become the rule rather than an exception for blue-chip companies (see on the development of CSR Carroll, 1999, p. 268). This development has been set forth and enriched through publications, such as the Brundtland (WCED, 1987) and Jenkins report (AICPA, 1994), Elkington's Triple Bottom Line (Elkington, 1999), Carroll's four-level CSR pyramid (Carroll, 1991, p. 42) and the Global Reporting Initiative guidelines in their most recent version (GRI, 2013). Second, the emergence of the International Integrated Reporting Council (IIRC) and its efforts for developing an integrated reporting framework enforce the

debate about the content of traditional reports. The IIRC (2013) sets out, not only to address different sources of a firm's performance and how they add value over time, but also to incorporate and connect sustainability and CSR information within the financial report, resulting in one single integrated report (Arnold et al., 2012, p.5). Thus, it can be inferred that this comprehensive report should contain all information that is relevant for an investor and therefore, supports the efficient allocation of capital. Following the IIRC, we expect value relevance not only to apply for information captured in financial measures, but also for non-financial, narrative information of annual reports. As Guthrie and Abeysekera (2006, p. 115) point out, "*what organizations choose to include in (and omit from) their annual reports is a conscious decision that communicates a significant message to stakeholders*". A widely used method for deriving patterns in the presentation of reporting information is content analysis, which allows the gathering and analysis of qualitative or non-financials data in annual reports (Guthrie and Abeysekera, 2006, p. 120). Assuming that individual perceptions are influenced by the extent to which companies report about a certain topic, we combine content analysis based on word counts within Swiss Performance Index (SPI) annual reports and factor analysis in order to determine and operationalize the extent of a set of non-financials. We define non-financials as information that is not expressed in cold figures. Building on that, our study aims to understand how different expressions relate to superordinate topics, such as sustainability and how those, in combination with relevant financials, are linked to market value of a firm.

The remainder of this paper is organized as follows. Section two presents the development of four guiding hypotheses based on relevant literature on value-relevance of both, financial and non-financial information. Section three describes the data collection using content analysis and the methodology is presented in section four. Finally, following the empirical analysis of results in section five, the conclusion is presented in section six.

2. THEORETICAL CONTEXT AND HYPOTHESES DEVELOPMENT

Value-relevance in an accounting context refers to the relation of a financial measure of value, primarily stock price, and a set of information of interest. Thus, value-relevant information can be considered as all forms of information that investors use for evaluating the firm (Wyatt, 2008, p. 221; Flöstrand and Ström, 2006, p. 580). As our focus lies on investors' perspectives, we do not further consider stewardship purposes or the relevance of accounting information for other users, such as creditors and unions (Francis and Schipper, 1999, p. 319). Value-relevance studies are fundamentally based on the classic understanding of efficient markets (Pareto), where all individuals dispose of homogeneous information with the same expectations regarding their implications. In this situation, more information is better than less and nobody is placed in a worse position as a result of additional information (Wyatt, 2008, p. 221; Lev and Ohlson, 1982, p. 294).

From a measurement perspective, a significant stream of empirical studies is linked to Ohlson's (1995) global model for evaluating how market value is related to accounting data and any other

information of interest (Wyatt, 2008, p. 222; Sievers et al., 2013, p. 470; see chapter 4). Ohlson (1995, p. 662) suggests the combination of the two bottom-line items of balance sheet and income statement: earnings and book value. Besides, there are various empirical observations proving evidence for the value-relevance of earnings and book value (Healy and Palepu, 2001, p. 406; Collins et al., 1997, p. 39). We decide to follow prior studies and base our analysis on Ohlson's model. The approach seems reasonable if one considers that financial statement information is the fundamental starting point for common business valuation. We see that this applies both, to pragmatic approaches as multiple valuation and complex approaches as discounted cash flow models. As stock-market valuations have a forward-looking perspective on the development of a firm, accounting information can be used as a proxy for a company's future profitability opportunities (Hirschey et al., 2001, p. 223). The underlying basic assumption is that higher future cash flows, result in higher value of the company (Bruner, 2004, p. 248). As a logical consequence, the higher the cash flows today, *ceteris paribus*, the higher the probability of higher cash flows in the future from an investor's perspective. Accordingly, we assume that profits are relevant information for an investor's general impression of a company's shape. When analyzing the financial statements of a company, an average investor will most likely focus on net income as this number is both easily observable and well known due to its, compared to other financials, dominating role in public media. Hence, we use net income as a quantitative measure for profitability within our study.

H1. Net Income is positively related to market value of a firm.

Just as convincing appears the integration of book value. Looking at the liquidation case, the value of a firm is calculated as a percentage of the book value of the current assets (Bruner, 2004, p. 255; Collins et al., 1997, p. 40). Hence, the liquidation value can be considered the bottom limit of a firm's value. It seems reasonable to suppose that companies with higher total book values, may expect higher liquidation proceeds. Moreover, research agrees that larger firms with more current assets have a reduced risk exposure (Mata and Portugal, 1994, p. 233; Huyghebaert et al., 2000, p. 635). In line with these views, we test the following hypotheses:

H2. Book Value is positively related to market value of a firm.

Together, net income and book value represent the first element of our model which is "financials information". As defined in this study, financials information is related to the financial statement and reaches the investor exclusively in numbers. However, as Tinker et al. (1991, p. 40) point out, "*annual reports provide one of the primary interpretations of financial statements*" and "*may be used to influence decisions by projecting selective impressions about a firm's prospects*". Following this, we assume that these interpretations of financial statement information are not only expressed in numbers, but also in the narrative part of the annual report. Therefore, in addition to numbers, information on profitability prospects can be

communicated through the extent of profitability related words, leading to hypotheses number three:

H3. The extent of “Profitability” content is positively related to market value of a firm.

We define this kind of qualitative information as “non-financials” information, as this information is not expressed in numbers or financial figures. The information can have financial-statement relation or not. Our definition is linked to the nature of the information (words or figures), rather than to its content (financial or non-financial). We make this clear distinction, as we note that the common use of the expression “non-financial information” is also used for quantifiable measures which may be elements of the profit and loss statement. R&D and advertising expenditures, for example, are linked to intangible assets, such as innovation ability or brands. It is non-financial related information, but expressed in figures, therefore in our categorization “financials” information.

The end of the 20th century and the following decades have been marked by increased concerns whether traditional reporting is capable to reflect the actual dimensions of value creation in a rapidly changing operating environment (Francis and Schipper, 1999, p. 323; Wallman, 1995, p. 83). As Wyatt (2008, p. 222) points out, “*financial measures are limited to the extent that they do not reflect the capitalized value of the expected benefits from intangible assets.*” She further advocates to “*consider these trade-offs in drawing conclusions from value-relevance studies*”. This stands in line with an investment based analysis comparing market and book value of S&P 500 companies since 1975. In 2010, the results show that on average about 80% of the market capitalization can be attributed to intangible asset, whereas only 20% to tangible assets (Ocean Tomo, 2013). In addition, Brown et al. (1999, p. 107) note a significant decline in value relevance of financial statement information in their panel study. The value-relevance of non-financial information in high-growth and rapidly changing industries is the subject of numerous studies that are able to find evidence for a significant relationship to market value (Deng et al., 1999, p. 20; Trueman et al. 2000, pp. 137, 138; Rajgopal et al., 2003, p.135).

A further crucial finding is made by Amir and Lev (1996, p. 4) who, analyzing the cellular communications industry, note that financial information, observed in an isolated manner, is not relevant for market value, whereas it turns relevant in combination with non-financial information and after intangible related adjustments. There are also a number of performance measurement studies demonstrating the predictive effect of non-financial information, such as customer satisfaction and quality, on financial results (Ittner et al., 1997, p. 32; Ittner and Larcker, 1998, p. 2; Banker et al., 2000, p. 65). With regard to the valuation of venture-capital backed companies, Sievers et al. (2013) can prove that valuation accuracy can be improved by combining accounting and non-accounting information, such as management characteristics. Even though this study takes its place among which can be termed as valuation-relevance studies (see also Simpson, 2010, p. 250) that rather seek to understand how different sources of information are used by financial analysts (Flöstrand and Ström, 2006, p.580), we see that all of

these findings point to an integrated view of value generation, with complementary importance of financials and non-financials information.

In our understanding, an integrated view does not only refer to different kinds of values that are created within the economic activity, but also to the manner in which these values are created. Within a broad market analysis, Eccles et al. (2011, p. 124) determine that environmental, social and governance (ESG) information is of relevance for investors for identifying how efficient and effective a company runs its business and even use it as an indicator for a company's future cash flows. Indeed, how a company is dealing with finite resources reflects how cash flows are going to be generated in the future and should therefore be of interest. In addition to these arguments, a lot of research has been conducted analyzing the relationship between financial performance, market reaction and the publication of ESG related information and sustainability (see e.g. Dhaliwal et al., 2011; Margolis et al., 2007; Orlitzky et al., 2003). There is also empirical evidence for value-relevance of environmental information, such as remediation costs (Barth and McNicholds, 1994, p. 200), global environmental standards (Dowell et al., 2000, p. 1059), environmental ratings (Hassel, 2005, p. 43) or published events (Klassen and McLaughlin, 1996, p. 1199; Feldman and Soyoka, 1997, p. 87). This leads to the importance of sustainability disclosure regarding environmental issues. The preparation of sustainable reports in accordance with the GRI (2013, p.17) requires the presentation of "*how an organization contributes, or aims to contribute in the future, to the improvement or deterioration of economic, environmental and social conditions, developments, and trends at the local, regional or global level*". This further requires "*discussing*" an organization's performance regarding "*the limits and demands placed on environmental or social resources*".

If these remarks are transferred, we assume that the extent of discussing how a company's economic activity impacts the natural environment, can be approximated by the extent of related words used within this context. We interpret extent both in terms of quantity and variety across a range of different expressions related to environmental sustainability. This is due to the assumption that a holistic reporting approach, addressing not only one, but various aspects and types of operating in a sustainable way, strengthens investors' impressions of sustainable economic activity. Applying the argumentation logic outlined above, we hypothesize:

H4: The extent of "Sustainability" content is positively related to market value of a firm.

3. DATA

3.1 Data Collection

3.1.1 Rationale for Content Analysis

The non-financials qualitative data for the study was collected using a form of content analysis of Swiss SPI companies. Content analysis, especially on intellectual capital and social, ethical and environmental reporting, is considered a well-established method for gathering data of annual reports (Guthrie and Abeysekera, 2006, p. 114; Alves, 2011, p. 147, Parker, 2005, p. 853). After reviewing series of academic work dealing with the definition and use of content

analysis, we conclude that Shapiro and Markoff's (1997, p. 14 as cited in Duriau et al., 2007, p. 6) more liberal definition as "*any methodological measurement applied to text (or other symbolic materials) for social science purpose*" perfectly suits our application of the method. Abbott and Monsen (1979, p. 504) for example, arrive at a narrower definition that explicitly refers to the specific technique how content analysis should be conducted: "*gathering data that consists of codifying qualitative information in anecdotal and literary form into categories in order to derive quantitative scales of varying levels of complexity.*" However, although coding of sentences and the analysis of tone is both, common and recommended (see for example Olsson, 2004; Abeysekera and Guthrie, 2005, p.120), we have decided against applying this method. Due to the necessity of individual interpretation and a resulting lack of transparency and replicability, coding appears inadequate for objective inferences to market value. Another approach, preferred within the study presented, is content analysis based on word counts. Prior research has identified word frequency as a sign for cognitive centrality (Huff, 1990 as cited in Duriau et al., 2007, p. 6) and focus of attention (Abrahamson and Hambrick, 1997, p. 528). The words used can transport information, even regardless of their semantic context (Pennebaker et al., 2003, p. 550).

Compared to verbal language which is heavily influenced by nonverbal communication, such as body language and mimic, information that is transmitted in written language is more fundamentally dependent on the actual word. Besides, prior research has acknowledged the advantage of words for allowing analyses in categories (Gray et al., 1995a, p. 84), which best corresponds to the use of factor analysis in our case. As described by Pennebaker et al. (2003, p. 550), this method and the resulting factor structure of words, allows the researcher to compare different data sources in terms of their content. Thus, we rely on word frequencies, as a maximum of objectivity is our major interest. This supports to a large extent the principle characteristics of content analysis according to Krippendorff (1980 as cited in Gray et al., 1995a, p. 80), who proposes objective, systematic and reliable data as a requirement for an effective analysis. Nevertheless, we are aware of potential limitations expressed by critics referring to the meaning of statements which is argued to be established with paragraphs and an overall context, rather than by the frequency of stand-alone words (see Abeysekera and Guthrie, 2005, p. 120).

3.1.2 Rationale for Annual Reports as Data Source

In regard to using annual reports for data gathering in content analysis, Abbott and Monsen's (1979, p. 507) consideration seems convincing: annual reports are public data, therefore immediately available for a large scale of firms after publication, without time consuming necessity of a firm's cooperation, which, in turn, assures replicability for reliability checks. In addition, with regard to reliability for cognitive phenomena, Osborne et al. (2001, p. 440) noticed an increased reliability of annual reports compared to interviews and questionnaires. Due to the range of corporate documents and information sources, it is almost impossible to identify all forms of relevant communications (Gray et al. 1995a, p. 82) and as Bowman (1984, p. 63) observes in tests, annual reports reflect a reasonable correspondence with objective reality. Contrary to widely held beliefs that annual reports are just written by public relations

experts for drawing an image of the firm, Bowman's study further reveals that the average chief executive officer regards the annual reports as major communication tool to both, external and internal addresses of the firm, and thus, devotes significant time from first subject sketching to later word level editing of the content (see also Barr et al., 1992, p. 21). There are several empirical examples of word count analyses, relying on annual reports only (Clapham and Schwenk, 1991; Frazier et al., 1984; Neu et al., 1998, Deegan and Gordon, 1996).

Another central aspect for the adoption of annual reports within our study are the remarks given by Gray et al. (1995b, p. 69): "*The annual report is considered widely to be a major formal document which acts as a significant presentation by an organization and has a major influence on perceptions of it.*" Gray et al. (1995a, p. 82) also conclude that "*The social and environmental factors frequently will produce conflicts with the financial ambitions of the organization and its owners. The presentation, within the same document or reporting process, of the financial on the one hand and the social and environmental on the other, becomes an important element in demonstrating the extent (if at all) to which organization reconciles these matters.*" This is where we draw the link to market-relevance and therefore, value-relevance of non-financials information. On the one hand, we assume that the extent of disclosure regarding a matter of interest reflects meanings and intentions of the reporting entity (Tinker et al., 1991, p. 40). On the other hand, we expect that this content influences how investors perceive the firm and hence, influences the allocation of capital. Thus, our analysis is not intended to discuss whether the information reflects corporate reality or not. We rather claim to address whether the information presented could be of relevance for investors. Unerman (2000, p. 674) argues that studies strictly investigating annual reports in an era of environmental and CSR stand-alone reports will fail to reveal relevant findings. We do not agree with this approach, as, herein lies the real problem: In an era of information overload and fast changing operating environments, we consider it crucial for corporations to incorporate all information that is relevant to the firm's value creation process, today and in the future, in one primary source of communication, rather than in several stand-alone reports.

3.1.3 Dictionaries

In his standard work "*Basis content analysis*" Weber (1990 as cited in Duriau et al. 2007, p. 19) recommends the use of dictionaries for conducting content analysis. Those dictionaries are previously generated word lists to a certain topic that predefine which words will be counted within the content analysis. The development of standard dictionaries for different social science purposes supports comparability and validity of content analysis (Kabanoff et al., 1995, p. 1080) and seems well-established in management research (Doucet and Jehn, 1997; Finkelstein, 1997; Short et al., 2010; Zachary et al., 2011a; Payne et al., 2011). Most of these studies use dictionary-based tools that either have standard dictionaries already implemented or at least enable their generation. An example for a famous and frequently used standard dictionary, is the Harvard Psychological Dictionary which can be applied for examining tone and sentiment in corporate disclosure (see for example Loughran and McDonald, 2011).

Taking into account the market orientation of a company, Zachary et al. (2011b) developed word lists that they tested in a family business environment (for an extensive description of the word list development see Zachary et al. 2011b, pp. 238, 239). Basically, those word lists are a modified and improved version of the standard dictionaries in Hart's (2000) content analysis program DICTION. We will use their dictionary in order to determine the extent of qualitative *Profitability* content within SPI reports.

The Environmental Literacy Council (2013), which is an independent non-profit organization for researchers, provides resources for studies in the field of environmental issues. A list of environmental science study words was determined that we considered suitable as a basis for examining the content of environmental orientation. The focus of this list lies in the ecological world, which is, how the variable "*Sustainability*" is defined within our study.

3.2 Sample

As outlined before, our primary objective is to explore the relevance of information regarding *Sustainability* aspects provided by listed companies within their annual reports. We assume that an extended corporate reporting containing such information requires specific resources not available to every company. Hence, we decide to build the sample on the Swiss Performance Index (SPI) which is regarded as Switzerland's overall stock market index (Swiss Exchange, 2013). Covering almost all Swiss companies listed on the Swiss Stock Exchange, the SPI leads to an appropriate and well diversified sample of 211 companies for this study. As banks, insurance companies and other financial sector corporations stick to very specific business models which are not related to *Sustainability* aspects in the sense of this study, we exclude 60 companies on the basis of their Global Industry Classification Standard (GICS) code. Another 13 companies do not publish English annual reports and can therefore, not be examined within this study. After all, our sample consists of 138 Swiss companies from different sectors. For these companies we collect the annual reports for the year 2012 which build the main database investigated within our analysis.

Table 1. Industry Structure of Sample

<i>Sector</i>	<i>GICS Code</i>	<i>Number</i>	<i>Percentage</i>
Energy	10	2	1.5%
Materials	15	16	11.6%
Industrials	20	46	33.3%
Consumer Discretionary	25	18	13.0%
Consumer Staples	30	10	7.3%
Health Care	35	24	17.4%
Information Technology	45	18	13.0%
Telecommunication Services	50	1	0.7%
Utilities	55	3	2.2%
n = 138			

Note: Code refers to the Global Industry Classification Standard.

4 RESEARCH METHODOLOGY

4.1 Multiple Regression for Testing Value-relevance

Following prior research, we use a common approach in the field of value-relevance studies in order to examine whether non-financials information regarding *Profitability* and *Sustainability* aspects in annual reports is value-relevant and thus, of interest for investors. Value-relevance studies use multiple linear regression to associate the value measure with the information items of interest (Wyatt, 2008, p. 222). While different research approaches use various forms of equations, this approach refers to the original model developed by Ohlson (1995). For the purpose of this study we used the following equation:

$$MV_i = \alpha + \beta_1 BV_i + \beta_2 NI_i + \beta_3 PR_i + \beta_4 SU_i + error_i$$

Table 2. Description of Variables

<i>Symbols</i>	<i>Description</i>
<i>Dependent Variable</i>	
<i>MV</i>	Market Value of Equity
<i>Predictors</i>	
<i>BV</i>	Book Value of Equity
<i>NI</i>	Net Income
<i>PR</i>	Non-financials Information regarding <i>Profitability</i>
<i>SU</i>	Non-financials Information regarding <i>Sustainability</i>
<i>Index</i>	
<i>I</i>	Company

Note: *MV_i* as published via Bloomberg® for end of march 2013. *BV_i*, *NI_i* as published in annual reports of 2012.

In order to test for hypotheses H_1 , H_2 , H_3 and H_4 the *Market Value of Equity* is used as dependent variable, whereas *Book Value of Equity*, *Net Income*, *Profitability* and *Sustainability* are considered as independent variables. As already outlined, *Book Value of Equity* as well as *Net Income* represent financials-information, thus, covering explicitly numbers. *Profitability* and *Sustainability*, classified as non-financials information, refer to narrative qualitative information, based on word counts within the annual report.

The annual reports of listed companies are usually published within the first three months of the year. As we intend to understand the relevance of information that is contained in these reports, it does not seem expedient to observe the market value of equity before the reports are available to the public. We assume that after the first three months of the year, all reports are published and the information has already been recognized by investors and is therefore, reflected in market value. This is why we decided to observe the companies' market value of equity at the end of March 2013, whereas we consider book value of equity and net income as disclosed in the annual reports 2012. For technical reasons this data has been collected via Bloomberg®.

4.2 Content Analysis and Factorial Analysis for Measuring the Information of Interest

An apparent characteristic of non-financial information is that it is linked to future expectations and their related effects on value creation, therefore difficult to identify and standardize. In contrast, traditional reporting primarily consisting of financial statement information has been standardized in a way that the information is universal and analyzed in research based on archival data (Flöstrand and Ström, 2006, p. 582). This points to the necessity of a sophisticated approach for measuring the information of interest that shall be examined within this study. Basically, our approach is based on the assumption that providing information to a specific topic within an annual report requires the use of related words more often. For example, reporting qualitative information regarding *Profitability* requires the use of words like *earnings*, *return* or *dividends*. In the same manner, reporting about *Sustainability* requires words like *biodiversity*, *carbon* or *water*. Building on that, the observation of a defined group of words within an annual report can be taken as an indicator for the provision of specific information. Accordingly, we measure the information of interest using word frequencies as described in chapter 3.

Hence, we apply the following approach: first, we use the content analysis specialized software tool atlas.ti for counting the occurrence of every word contained in all sample annual reports of the year 2012. Second, we select the counts for the words which are related to *Profitability* and *Sustainability* respectively. In order to guarantee a maximum of objectivity, we avoid self-selection of relevant words and use predefined dictionaries as already outlined in chapter 3.1.3. The two dictionaries used contain a total of 484 words concerning *Profitability* or *Sustainability*. In a first attempt for reducing the mass of data, we exclude all words appearing less than 14 times throughout all reports (about 10% of the 138 sample observations). On the one hand, this is intended for technical reasons, on the other hand we assume that words appearing only in a very small number cannot provide a good indication for a specific content. In order to perform the regression model described above, it is necessary to determine the two variables *Profitability* and *Sustainability* based on the remaining words. For this purpose, conducting factorial analysis is an appropriate measure (Backhaus et al., 2003, p. 260). This procedure is useful not only to quantify the two relevant variables, but also for reducing disturbing influences and getting reliable measures (Wirtz & Nachtigall, 2012, p. 201). As the word-counts should give a clear indication of non-financials information disclosure regarding *Sustainability* and *Profitability* in annual reports, an important step is to consider only those words that can be explicitly allocated to one of the two variables. All other words are neglected and SPSS is used to extract the final factors for the regression as described in section 4.1.

5 EMPIRICAL ANALYSIS AND RESULTS

5.1 Data Description

Analyzing the frequency of the 484 words contained in the two dictionaries displays a great degree of variance. While some of them occur only a few times throughout the 138 observed

annual reports, others are strongly represented. Figure 1 provides an overview of the frequency of the listed words within all explored annual reports. After the exclusion of word counts less than 14 times, 214 words remain for the factorial analysis. 66 words are found 14 to 50 times while 92 words occur 51 to 500 times. 56 words can be found in the annual reports more often than 500 times.

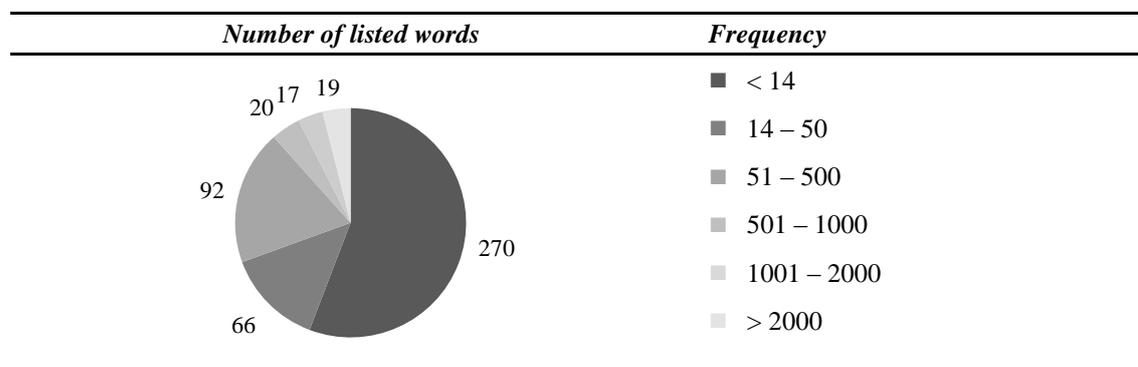


Figure 1. Frequency of listed words throughout observed annual reports

As described above we use word-counts as input data to obtain the variables *Profitability* and *Sustainability* for further analysis. Aside from that, we collect additional data regarding financial information. Table 3 summarizes descriptive statistics for all variables which are analyzed within the linear regression.

Table 3. Descriptive Statistics

<i>Variables</i>	<i>Mean</i>	<i>Media</i>	<i>Min</i>	<i>Max</i>
Market Value of Equity	7'519'794	557'447	6'751	221'382'524
<i>Financials Information</i>				
Book Value of Equity	2'330'392	320'509	464	69'219'000
Net Income	334'336	20'974	-778'000	10'228'000
<i>Non-Financials Information</i>				
Profitability	0.000	0.000	-1.228	5.547
Sustainability	0.000	0.000	-0.346	7.930

Note: Market Value of Equity, Book Value of Equity and Net Income are stated in millions of Swiss francs.

For market value of equity, book value of equity and net income, the means are substantially larger than the medians which indicates that our sample includes a small number of very large companies. Furthermore, the minimal and maximal values show a broad range regarding size and performance. As *Profitability* and *Sustainability* represent factor scores calculated using SPSS, the variables are as a matter of principle z-standardized with $N \sim (0,1)$, hence display mean and median values of 0.

5.2 Factorial Analysis Results

Firstly, we include all 214 remaining words for running the factorial analysis in SPSS. Therefore, we use both, principal component analysis and eigenvalues greater than 1 as extraction methods. This first analysis rules out that some words cannot be centralized within a specific factor and others not be allocated to a single factor. In order to get a clear and precise structure with two factors, we exclude these words from the analysis. After that, 33 words remain for the final factorial analysis and define both factors, *Profitability* and *Sustainability*.

For getting meaningful results, it is required to test the data regarding qualification for factorial analysis. In this respect, we use the Kaiser-Meyer-Olkin measure which provides a good indication of data suitability (Backhaus et al., 2003, p. 276). Calculated via SPSS, the Kaiser-Meyer-Olkin measure for the collected data is 0.871. Based on the scale established by Kaiser and Rice (1974, p. 112), this can be called a meritorious score which gives clear indication of the qualification of our data.

The most clear and precise structure can be derived using rotation (Wirtz & Nachtigall, 2012, p. 212). However, in our case, it turns out that it is not necessary to apply rotation, but as the results are getting even better, we still decide to use the varimax method.

After determining the 33 items, we test for reliability of our design by calculating the number of factors that can be derived from the items based on the Kaiser criterion. This probably most common technique for determining the number of factors was first introduced by Kaiser (1960) and suggests to extract all factors showing eigenvalues greater than 1 (Hill & Lewicki, 2006, p. 235). As calculated in SPSS, the first two factors have eigenvalues of 12.98 and 8.31. Furthermore, another potential factor offers a significantly lower eigenvalue at least a little higher than 1 (1.43). In addition to the Kaiser criterion, Cattell (1966) proposes the scree test to determine the number of factors to extract. This test consists of a visual presentation of the eigenvalues of all components considered in the analysis and the identification of an elbow in the chart. As it is recommended to extract all factors on the left side of the elbow, the scree plot shown in figure 2 also leads to the assumption of two factors based on our dataset.

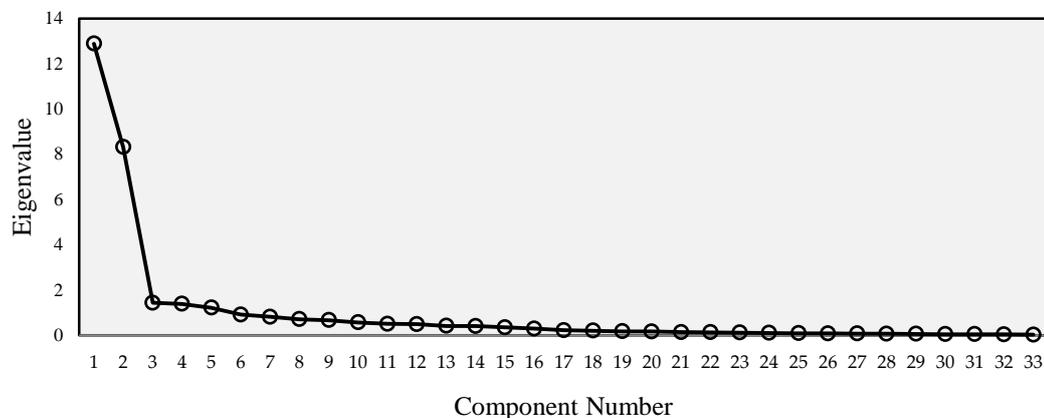


Figure 2. Scree Plot for 33 Items

After all, our presumption of the two factors *Profitability* and *Sustainability* is well supported by statistical results and corresponding tests. In total, they explain 64.24% and a significant proportion of the variance contained in the data. Setting the number of factors that shall be extracted to two, using varimax rotation, and suppressing loadings smaller than 0.4, the factorial analysis calculated in SPSS results in a very precise and clear structure shown in table 4.

Table 4. Rotated Component Matrix

<i>Item</i>	<i>Component</i>	
	1	2
Profitability_cash	0.947	
Profitability_paid	0.923	
Profitability_value	0.914	
Profitability_earnings	0.891	
Profitability_income	0.869	
Profitability_effective	0.845	
Profitability_net	0.843	
Profitability_benefits	0.835	
Profitability_benefit	0.833	
Profitability_proceeds	0.821	
Profitability_pay	0.814	
Profitability_cost	0.804	
Profitability_beneficial	0.779	
Profitability_gain	0.756	
Profitability_effectiveness	0.746	
Profitability_return	0.743	
Profitability_dividends	0.723	
Profitability_making	0.694	
Profitability_reward	0.650	
Sustainability_drought		0.940
Sustainability_ethanol		0.940
Sustainability_irrigation		0.932
Sustainability_native		0.930
Sustainability_biodiversity		0.912
Sustainability_genetic		0.907
Sustainability_rain		0.892
Sustainability_erosion		0.871
Sustainability_pipeline		0.715
Sustainability_chemical		0.531
Sustainability_spectrum		0.471
Sustainability_conservation		0.442
Sustainability_carbon		0.426
Sustainability_water		0.421
n = 33		

Note: Coefficients are sorted by size and coefficients smaller than 0.4 are suppressed. Extraction method is principal component analysis. Rotation method is varimax.

5.3 Results from Regression Analysis

After building the two variables *Profitability* and *Sustainability* of the 33 words used as items in the context of factorial analysis, the variables can be tested for value-relevance. As mentioned before, we use a multiple linear regression model with the market value of the companies as dependent variable. The predictors that are tested for value-relevance are book value of equity and net income of the companies as reported in the annual reports 2012 as well as the two variables *Profitability* and *Sustainability* which represent the non-financials information regarding these topics. The SPSS output shows an adjusted R-square of 0.987. Concerning multicollinearity which is a common problem in multiple linear regression models and leading to biased results, SPSS offers adequate collinearity statistics which are represented in table 5. Multicollinearity of a specific variable is indicated by a tolerance equal or less than 0.1 as well as a variance inflation factor (VIF) greater than 10 (Meyers et al., 2006, p.212). Since none of the variables in our study shows a tolerance below 0.2 or a VIF exceeding 5, we assume that multicollinearity is not a serious problem in this case.

Table 5. Collinearity Statistics

<i>Variable</i>	<i>Tolerance</i>	<i>VIF</i>
<i>Financials Information</i>		
Book Value of Equity	.207	4.841
Net Income	.219	4.574
<i>Non-financials Information</i>		
Profitability	.898	1.114
Sustainability	.750	1.333

Table 6 (p. 16) summarizes the results of the regression as calculated in SPSS. The standardized coefficients of the variables book value and net income are both positive and highly significant, which can be derived from the t-values of 4.146 and 42.821 respectively. This indicates that book value and net income have a positive impact on market value, thus, can be considered value-relevant in the context of the underlying model. As prior research describes this relationship, this is not a surprising result, but nevertheless confirms hypothesis H_1 and H_2 and the accuracy of the applied regression model. Standardized coefficients for *Profitability* and *Sustainability* have a positive relation as well. According to the t-values of 2.034 and 2.696, both results are highly significant and therefore, by definition statistical evidence for hypothesis H_3 and H_4 . In technical terms this means that *Profitability* and *Sustainability* as defined in this study are positively correlated with the *Market Value* of the company. Given that necessary assumptions are met, our analysis provides objective evidence that specific non-financials information related to *profitability* and *sustainability* aspects is value-relevant and therefore, of interest for investors.

Table 6. Summarized Results of Multiple Linear Regression

<i>Variable</i>	<i>Expected sign</i>	β	<i>t-statistics</i>	<i>Significance</i>
Intercept			2.236	.027
<i>Financials Information</i>				
Book Value of Equity	+	.090 ***	4.146	.000
Net Income	+	.900 ***	42.821	.000
<i>Non-financials Information</i>				
Profitability	+	.021 **	2.034	.044
Sustainability	+	.031 ***	2.696	.008

n = 138

Adjusted R² = 0.987

Note: ***, **, and * indicate the significance at the 1%, 5% and 10% levels, two-tailed. β = standardized coefficients. Dependent Variable = market value (2012).

6 SUMMARY AND CONCLUSIONS

Our study extends a line of research regarding value-relevance of non-financial information disclosure and its integration in annual reports. Observing that standard research methodologies are often limited to assessing number based information that is published in this exact form by the reporting entity, we intend to overcome this limitation by adopting a complementary approach that aims not only to incorporate financial and non-financial information within one empirical model, but also to acknowledge their differing nature.

As we assume both, financial and non-financial information as value-relevant, we aim to link these two elements within one empirical model by conducting a two stage analysis. First, we consider relevant financial statement figures represented by net income as a first proxy for profitability and book value of equity. Second, focusing on narrative information regarding profitability and sustainability aspects of corporate activity, we apply content analysis based on word frequency and factor analysis for operationalizing the non-financial variables. By this, we are able to derive variables representing both, quantity and variety across a range of different expressions related to profitability and sustainability activity in our multiple linear regression model.

As expected and reported in various value-relevance studies, net income and book value have a significant influence on market value. But even more interesting, we are able to provide substantial empirical evidence that narrative information within the annual report influences investors' perceptions and therefore, affects market value. Indeed, our results strongly support the assumption that investors acknowledge corporate action across a wide range of possible responsibilities for a sustainable development that ensures future cash flows. In particular, for understanding the relationship between market value and qualitative non-financial information, we propose to take a more differentiated view on the nature of information. The study makes clear that information can be effectively transmitted through both, figures and narrative text. Therefore, we think that the latter should not be analyzed by only translating it in the former.

Furthermore, relevant insights for theory and practice can be derived. From a theoretical perspective, by using literature-established dictionaries, we aim to enhance reliability and overcome general limitations of content analysis resulting of the researcher's subjective coding influence. However, for drawing valid inferences even better, we suggest to develop dictionaries based on investors' input and retest our model. In addition, we propose the use of research tools that are able to capture content of pictures and diagrams, which were not taken into account in this study. Regarding narrative information the results of our study suggest that the usefulness is even greater when it is communicated across a broad range of expressions. We conclude that this gives the impression that the firm pursues a holistic strategy for its activities. We further add empirical evidence to the debate about integrating information in one report. Accordingly, rather than distributing information in several, unconnected stand-alone reports, we suggest to adapt reporting practices and incorporate all information that has exploratory power on market value within the major communication tool.

Finally, we propose broadening research approaches for non-financial information for taking into account its differing nature. This may lead to a better understanding of non-financial information, its context and streams that add value to the company and thus, result in an even more powerful corporate communication of value-creation.

REFERENCES

- Abbott, W. and Monsen, R. (1979), On the measurement of corporate social responsibility: self-reported disclosures as a method of measuring corporate social involvement, *Academy of Management Journal*, 22(3), 501–515.
- Abeysekera, I. and Guthrie, J. (2005), An empirical investigation of annual reporting trends of intellectual capital in Sri Lanka, *Critical Perspectives on Accounting*, 16(3), 151–163.
- Aboody, D. and Lev, B. (1998), The Value Relevance of Intangibles: The Case of Software Capitalisation, *Journal of Accounting Research*, 36, Supplement, 161–191.
- Abrahamson, E. and Hambrick, D. (1997), Attentional homogeneity in industries: the effect of discretion, *Journal of Organizational Behavior*, 18, 513–532.
- AICPA (1994), Improving Business Reporting – A Customer Focus: Meeting the Information Needs of Investors and Creditors; Comprehensive Report of the Special Committee on Financial Reporting, American Institute of Certified Public Accountants, New York.
- Alves, M. (2011), Content Analysis: Its Use in Accounting Publications, *Revista Universo Contábil*, (7) 3, 146–166.
- Amir, E. and Lev, B. (1996), Value Relevance of Nonfinancial Information: The Wireless Communications Industry, *Journal of Accounting and Economics*, 3–30.
- Arnold, M., Bassen, A. and Frank, R. (2012), Integrating Sustainability Reports into Financial Statements: An Experimental Stud., Working Paper, University of Hamburg.
- Backhaus, K., Erichson, B., Plinke, W. and Weiber, R. (2003), *Multivariate Analysemethoden – Eine anwendungsorientierte Einführung*, Berlin, Heidelberg and New York: Springer.
- Banker, R., Potter, G. and Srinivasan, D. (2000), An Empirical Investigation of an Incentive Plan that Includes Nonfinancial Performance Measures, *The Accounting Review*, 75, 65–92.
- Barr, P., Stimpert, J. and Huff, A. (1992), Cognitive change, strategic action, and organizational renewal, *Strategic Management Journal*, 13, 15–36.
- Barth, M. and McNichols, M. (1994), Estimation and Market Valuation of Environmental Liabilities Relating to Superfund Sites, *Journal of Accounting Research*, 32, 177–209.
- Berndt, T. and Leibfried, P. (2007), Corporate Governance and Financial Reporting, *Corporate Ownership & Control*, 4 (4), 397–400.
- Bessen, J. (2007), Estimates of Firms' Patent Rents from Firm Market Value, Working Paper, Boston University School of Law, November 2007, Working Paper Number 06-14.
- Bowman, E. (1984), Content analysis of annual reports for corporate strategy and risk, *Interfaces*, 14, 61–71.
- Brown, S., Lo, K. and Lys, T. (1999), Use of R2 in Accounting Research: Measuring Changes in Value Relevance over the Last Four Decades, *Journal of Accounting & Economics*, 28 (2), 83–115.
- Bruner, R. (2004), *Applied Mergers & Acquisitions*, New Jersey: John Wiley & Sons.
- Carroll, A. (1991), The Pyramid of Corporate Social Responsibility: Toward the Moral Management of Organizational Stakeholders, *Business Horizons*, 34 (4), 39–48.

ADVANCING VALUE-RELEVANCE STUDIES ON NON-FINANCIAL INFORMATION:
A COMPLEMENTARY APPROACH

- Carroll, A. (1999), Corporate Social Responsibility: Evolution of a Definitional Construct, *Business & Society*, 38 (3), 268–295.
- Cattell, B. (1966), The scree test for the number of factors, *Multivariate Behavioral Research*, 1 (2), 245–276.
- Chambers, D. (2007), Has Goodwill Accounting under SFAS 142 Improved Financial Reporting?, Working Paper, Kennesaw State University, April 2007.
- Clapham, S. and Schwenk, C. (1991), Self-serving attributions, managerial cognition, and company performance, *Strategic Management Journal*, 12, 219–229.
- Collins, D., Maydew, E. and Weiss, I. (1997), Changes in the Value-Relevance of Earnings and Book Values Over the Past Forty Years, *Journal of Accounting and Economics*, 24, 39–67.
- Darby, M., Liu, Q. and Zucker, L. (1999), Stakes and Stars: The Effect of Intellectual Human Capital on the Level and Variability of High-Tech Firms' Market Values', Working Paper, The National Bureau of Economic Research, June 1999, Working Paper Number 7201.
- Deegan, C. and Gordon, B. (1996), A study of the environmental disclosure practices of Australian corporations, *Accounting and Business Research*, 26 (3), 187–199.
- Deng, Z., Lev, B. and Narin, F. (1999), Science and technology as predictors of stock performance, *Financial Analysts Journal*, 55(3), 20–32.
- Dhaliwal, D., Li, O., Tsang, A. and Yang, Y. (2011), Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting, *The Accounting Review*, 86 (1), 59–100.
- Doucet, L and Jehn, K. (1997), Analyzing harsh words in a sensitive setting: American expatriates in communist China, *Journal of Organizational Behavior*, 18, 559–582.
- Dowell, G., Hart, S. and Yeung, B. (2000), Do corporate global environmental standards create or destroy market value?, *Management Science*, 46(8), 1059–1074.
- Duriau, V., Reger, R. and Pfarrer, M. (2007), A Content Analysis of the Content Analysis Literature in Organization Studies: Research Themes, Data Sources, and Methodological Refinements, *Organizational Research Methods*, 10, 5–34.
- Eccles, R., Serafeim, G. and Krzus, M. (2011), Market Interest in Nonfinancial Information, *Journal of Applied Corporate Finance*, 23 (4), 113–127.
- Elkington, J. (1999), *Cannibals With Forks: The Triple Bottom Line of 21st Century*, Gabriola Island: New Society Publishers.
- Environmental Literacy Council (2013), Environmental Science Study Words: Scientific Analysis. Observing the Natural World, <http://www.enviroliteracy.org/article.php/166.html>.
- Fama, E. and Jensen, M. (1983), Separation of Ownership and Control, *Journal of Law and Economics*, 26 (2), 301–325.
- Feldman, S. and Soyoka P. (1997), Does improving a firm's environmental management system and environmental performance result in a higher stock price?, *The Journal of Investing*, 6(4), 87–97.

- Finkelstein, S. (1997), Interindustry Merger Patterns and Resource Dependence: A Replication and Extension of Pfeffer (1972), *Strategic Management Journal*, 18 (10), 787–810.
- Flöstrand, P. and Ström, N. (2006), The valuation relevance of non-financial information, *Management Research News*, 29 (9), 580–597.
- Francis, J. and Schipper, K. (1999), Have Financial Statements Lost Their Value Relevance?, *Journal of Accounting Research*, 37 (2), 319–352.
- Frazier, K., Ingram, R. and Mack Tennyson, B. (1984), A methodology for the analysis of narrative accounting disclosure, *Journal of Accounting Research*, 22, 318–331.
- Gray, R., Kouhy, R. and Lavers, S. (1995a), Methodological themes: Constructing a research database of social and environmental reporting by UK companies, *Accounting, Auditing & Accountability*, 8 (2), 78–101.
- Gray, R., Kouhy, R. and Lavers, S. (1995b), Corporate social and environmental reporting: A review of the literature and a longitudinal study of UK disclosure, *Accounting, Auditing & Accountability Journal*, 8(2), 47–77.
- Greenhalgh, C. and Rogers, M. (2006), The Value of Innovation: The Interaction of Competition, R&D and IP, *Research Policy*, 35 (4), 562–580.
- GRI (2013), What Is GRI? Global Reporting Initiative,
<https://www.globalreporting.org/information/about-gri/what-is-GRI/Pages/default.aspx>.
- Guthrie, J. and Abeysekera, I. (2006), Content analysis of social, environmental reporting: what is new?, *Journal of Human Resource Costing & Accounting*, 10 (2), 114–126.
- Hall, B., Jaffe, A. and Trajtenberg, M. (2005), Market Value and Patent Citations, *The RAND Journal of Economics*, 36, 16–38.
- Hart, R. (2000), DICTION 5.0: The text-analysis program, Thousand Oaks: Sage Publications.
- Hassel, L., Nilsson, H. and Nyquist, S. (2005), The Value Relevance of Environmental Performance, *European Accounting Review*, 14, 41–61.
- Healy, P. and Palepu, K. (2001), Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature, *Journal of Accounting and Economics*, 31, 405–440.
- Hill, T. and Lewicki, P. (2006), *Statistics, Methods and Applications*, A comprehensive reference for science, industry, and data mining, 1st Edition, Tulsa: StatSoft
- Hirschey, M., Richardson, V. and Scholz, S. (2001), Value Relevance of Non-financial Information: The Case of Patent Data, *Review of Quantitative Finance and Accounting*, 17, 223–235.
- Huff, A. (1990), *Mapping strategic thought*, Chichester, New York: John Wiley and Sons.
- Huyghebaert, N., Gaeremynck, A., Roodhooft, F. and Van de Gucht, L. (2000), New firm survival: the effects of start-up characteristics, *Journal of Business Finance and Accounting*, 27(5–6), 627–651.
- IIRC (2013), The International <IR> Framework. International Integrated Reporting Council,
<http://www.theiirc.org/wp-content/uploads/2013/12/13-12-08-THE-INTERNATIONAL-IR-FRAMEWORK-2-1.pdf>.

ADVANCING VALUE-RELEVANCE STUDIES ON NON-FINANCIAL INFORMATION:
A COMPLEMENTARY APPROACH

- Ittner, C. and Larcker, D. (1998), Are Nonfinancial Measures Leading Indicators of Financial Performance? An Analysis of Customer Satisfaction, *Journal of Accounting Research*, 36(Supplement), 1–35.
- Ittner, C., Larcker, D. and Meyer, M. (1997), Performance, Compensation, and the Balanced Scorecard, Working Paper, University of Pennsylvania, November 1997.
- Jennings, R., Robinson, J., Thompson, R. and Duvall, L. (1996), The Relationship between Accounting Goodwill Numbers and Equity Values, *Journal of Business Finance and Accounting*, 23 (4), 513–533.
- Jensen, M. and Meckling, W. (1976), Theory of the Firm – Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics*, 3 (3), 305–360.
- Kabanoff, B., Waldersee, R. and Cohen, M. (1995). Espoused Values and Organizational Change Themes, *The Academy of Management Journal*, 38 (4), 1075–1104.
- Kaiser, H. (1960), The application of electronic computers to factor analysis, *Educational and Psychological Measurement*, 20, 141–151.
- Kaiser, H. and Rice, J. (1974), Little Jiffy, Mark IV, *Educational and Psychological Measurement*, 34 (1), 111–117.
- Kallapur, S. and Kwan, S. (2004), The Value Relevance and Reliability of Brand Assets Recognized by U.K. Firms, *The Accounting Review*, 78 (1), 151–172.
- Klassen, R. and McLaughlin, C. (1996), The impact of environmental management on firm performance, *Management Science*, 42 (8), 1199–1214.
- Krippendorff, K. (1980), Content Analysis: An Introduction to its Methodology, New York: Sage Publications.
- Lev, B. and Ohlson, J. (1982), Market-Based Empirical Research in Accounting – A Review, Interpretation, and Extension, *Journal of Accounting Research*, 20, Supplement, 249–322.
- Lev, B. and Zarowin, P. (1999), The Boundaries of Financial Reporting and How to Extend Them, *Journal of Accounting Research*, 353–385.
- Loughran, T. and McDonald, B. (2011), When Is a Liability Not a Liability? Textual Analysis, Dictionaries, and 10-Ks, *The Journal of Finance*, 66, 35–65.
- Margolis, J., Elfenbein, H. and Walsh, J. (2007), Does it Pay to Be good? A Meta-Analysis and Redirection of Research on the Relationship Between Corporate Social and Financial Performance. Working Paper, Harvard University.
- Mata, J. and Portugal, P. (1994), Life duration of new firms, *The Journal of Industrial Economics*, 42(3), 227–245.
- Meyers, L., Gamst, G. and Guarino, A. (2006), Applied Multivariate Research, Design and Interpretation, Thousand Oaks: Sage Publication.
- Neu, D., Warsame, H. and Pedwell, K. (1998), Managing public impressions: environmental disclosures in annual reports, *Accounting, Organizations and Society*, 23 (3), 265–282.

- Ocean Tomo (2013), Intangible Asset Market Value,
<http://www.oceantomo.com/productsandservices/investments/intangible-market-value>.
- Ohlson, J. (1995), Earnings, book value, and dividends in equity valuation, *Contemporary Accounting Research*, 11 (2), 661–687.
- Olsson, B. (2004), Intellectual capital disclosure through annual reports: a study of the Swedish retail industry, *Journal of Human Resource Costing and Accounting*, 8 (2), 57–72.
- Orlitzky, M., Schmidt, F. and Rynes, S. (2003), Corporate Social and Financial Performance: A Meta-analysis, *Organization Studies*, 24 (3), 403–441.
- Osborne, J., Stubbart, C. and Ramaprasad, A. (2001), Strategic Groups and Competitive Enactment: A Study of Dynamic Relationships between Mental Models and Performance, *Strategic Management Journal*, 22, 435–454.
- Parker, L. (2005), Social and environmental accountability research: a view from the commentary box, *Accounting, Auditing & Accountability Journal*, 18 (6), 842–860.
- Payne, G., Brigham, K., Broberg, J., Moss, T. and Short, J. (2011), Organizational virtue orientation and family firms, *Business Ethics Quarterly*, 21, 257–285.
- Pennebaker, J., Mehl, M. and Niederhoffer, K. (2003), Psychological Aspects of Natural Language Use: Our Words, Our Selves, *Annual Review of Psychology*, 54, 547–577.
- Rajgopal, S., Venkatachalam, M. and Kotha, S. (2003), The value relevance of network advantages: the case of E-commerce firms, *Journal of Accounting Research*, 41, 135–162.
- Sha, S., Stark, A. and Akbar, S. (2008), Firm Size, Sector and market valuation of R&D expenditures, *Applied Financial Economics Letters*, 4 (2), 87–91.
- Shapiro, G. and Markoff, G. (1997), Text analysis for the social sciences: Methods for drawing statistical inferences from text and transcripts, 9-31, In: C.W. Roberts (Ed.), Mahwah, New York: Lawrence Erlbaum Associates.
- Short, J., Broberg, J., Cogliser, C. and Brigham, K. (2010), Construct validation using computer-aided text analysis (CATA): An illustration using entrepreneurial orientation, *Organizational Research Methods*, 13, 320–347.
- Sievers, S., Mokwa, C. and Keienburg, G. (2013), The Relevance of Financial versus Non-Financial Information for the Valuation of Venture Capital-Backed Firms, *European Accounting Review*, 22(3), 467–511.
- Simpson, A. (2010), Analysts' use of non-financial information disclosures, *Contemporary Accounting Research*, 27, 249–288.
- Sougiannis, T. (1994), The Accounting Based Valuation of Corporate R&D, *The Accounting Review*, 1, 44–68.
- Swiss Exchange (2013), SPI ® – the Index of Swiss Shares,
http://www.six-swiss-exchange.com/indices/shares/spi_en.html.

ADVANCING VALUE-RELEVANCE STUDIES ON NON-FINANCIAL INFORMATION:
A COMPLEMENTARY APPROACH

- Tinker, T., Lehman, C. and Neimark, M. (1991), Falling down the Hole in the Middle of the Road: Political Quietism in Corporate Social Reporting, *Accounting, Auditing & Accountability Journal*, 4(2), 28–54.
- Trueman, B., Wong, F. and Zhang, X. (2000), The eyeballs have it: searching for the value in internet stocks, *Journal of Accounting Research*, 38, 137–162. Supplement on Studies on Accounting Information and the Economics of Firm.
- Unerman, J. (2000), Methodological issues: Reflections on quantification in corporate social reporting content analysis, *Accounting, Auditing & Accountability Journal*, 13 (5), 667–680.
- Wallman, S. (1995), The Future of Accounting and Disclosure in an Evolving World: The Need for Dramatic Change, *Accounting Horizons*, 9 (3), 81–91.
- WCED (1987). Our common future. World Commission on Environment and Development, Oxford: Oxford University Press.
- Weber, R. (1990), Basis content analysis (2nd edition), Thousand Oaks: Sage Publications.
- Wirtz, M. and Nachtigall, C. (2012), Deskriptive Statistik. Statistische Methoden für Psychologen Teil 1. 6., überarbeitete Auflage, Weinheim and Basel: Beltz Juventa Verlag.
- Wyatt, A. (2008), What financial and non-financial information on intangibles is value-relevant? A review of the evidence, *Accounting and Business Research*, 38 (3), 217–256.
- Zachary, M., McKenny, A., Short, J. and Payne, G. (2011b), Family business and market orientation: Construct validation and comparative analysis, *Family Business Review*, 24(3), 233–251.
- Zachary, M., McKenny, A., Short, J., Davis, K. and Wu, D. (2011a), Franchise branding: An organizational identity perspective, *Journal of the Academy of Marketing Science*, 39, 629–645.