Are narrative CSR disclosures relevant for investors? Empirical evidence from Germany
Verbeeten, F.H.M.; Gamerschlag, R.; Möller, K.

Citation for published version (APA):

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: http://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.
Are narrative CSR disclosures relevant for investors?

Empirical evidence from Germany

Working paper, version June 2014

FRANK VERBEETEN *)
University of Amsterdam/Utrecht University School of Economics, The Netherlands

RAMIN GAMERSCHLAG
Georg-August-Universität Göttingen, Germany

KLAUS MÖLLER
University of St. Gallen, Switzerland

*) corresponding author. Correspondence address: University of Amsterdam Business School, Room M1.19, Plantage Muidergracht 12, 1018 TV Amsterdam. E-mail fh.m.verbeeten@uva.nl. Tel. +31 20 5257651.

A previous version of this paper has benefited from comments and suggestions by Peter Roosenboom as well as workshop participants at Rotterdam School of Management, Erasmus University; and University of Göttingen.
Abstract

CSR disclosures relate to the provision of information on companies’ environmental and social performance to external stakeholders. Although such disclosures can be directed at several stakeholders other than the (potential) firm shareholders, they may be relevant for valuation purposes. Based on the global reporting initiative (GRI) guidelines, we use content analysis to assess the value relevance of CSR disclosures of 130 German companies over 4 years. Germany is an interesting setting as CSR disclosures are mostly voluntarily, even though the institutional environment appears sensitive to CSR disclosures. Our results show that CSR information is value-relevant, but the value relevance of CSR information differs amongst CSR categories. Specifically, the disclosure of social (i.e. employee-related) information is positively associated with firm value yet environmental disclosures are not. Our results confirm that management should be aware of the potential capital market effects of voluntary CSR disclosures, even though they are not directed at shareholders as such.

Keywords:

Content Analysis, Corporate Social Responsibility, Global Reporting Initiative, Value Relevance, Voluntary Disclosure
1 Introduction

In the last three decades, corporate social responsibility (CSR) has become an issue of growing interest for society as well as for academics. Issues such as pollution, waste, resource depletion, product quality and safety, and the rights and status of workers have become the focus of increasing attention and concern (Reverte, 2009). Business organizations are increasingly viewed as being accountable for their social and environmental impacts (Brammer & Pavelin, 2006). As a result, the reporting of CSR information is becoming more prevalent as investors, customers, employees, regulators and other stakeholders demand greater transparency (Kim et al., 2012). Companies nowadays spend a great deal of time, effort and money on disclosing information on their social and environmental performance in order to respond to the demands from various stakeholders with whom they interact. Despite the increase of CSR reporting in practice, there is little academic evidence regarding the value relevance of (specific) CSR disclosures (Clarkson et al., 2013; Dhaliwal et al., 2012; Cho et al., 2012; Al-Tuwaijri et al., 2004).

In this paper, we analyze whether capital markets value the CSR information that is voluntarily disclosed by German companies and, if so, which specific CSR information is value-relevant. Understanding this relation is of increasing interest to academics and practitioners (Dhaliwal et al., 2012) as CSR reporting is costly, yet has also been argued to facilitate future performance prediction (Clarkson et al., 2013) and reduce the cost of equity (Dhaliwal et al., 2012). We test two competing predictions about the effect of voluntary CSR disclosures. Previous research (see Margolis & Walsh, 2003; Orlitzky et al., 2003) suggests that better CSR performance is associated with increased financial performance. In such a situation, economic
theory (Dye, 1985; Verrecchia, 1983) predicts a positive association between discretionary CSR disclosures and stock price performance. The notion is that superior CSR performers will convey their performance which – due to legal and other obligations – is difficult to mimic by inferior firms (Clarkson et al., 2008). Inferior performers will choose to disclose less or to be silent on their CSR performance; investors will place these inferior firms in an ‘average type’ pool. This partial disclosure equilibrium is sustained by the proprietary costs associated with CSR disclosure (Verrecchia, 1983) and uncertainty on whether the manager of the firm is informed regarding this type of information (Dye, 1985).

Alternatively, socio-political theories (including legitimacy theory and stakeholder theory; see Reverte, 2009; Clarkson et al., 2008; Patten, 2002) predict a negative association between CSR disclosure and stock prices. These theories suggest that CSR disclosure is a function of social, political and other stakeholder’s pressures facing the firm. To the extent that poor environmental performers face more political and social pressures and threatened legitimacy, they will attempt to increase discretionary CSR disclosures in order to change stakeholder perceptions about their CSR performance or their (costly) actions to repair or improve their CSR performance (Clarkson et al., 2008). Both poor CSR performance (liabilities) as well as the improvement actions (higher operational costs) are likely to be associated with lower stock prices. Therefore, we have competing directional predictions from alternative theories on the value relevance of CSR disclosures.

Based on the global reporting initiative (GRI) guidelines, we use content analysis to construct a number of CSR disclosure indices from the information provided in corporate
reports. We interpret these CSR disclosure indices as “other information” that can be included in valuation models (see Ohlson, 1995, 1999; Feltham & Ohlson, 1995, 1996), and test whether these CSR disclosures are value-relevant. We focus on the CSR disclosures in the years 2006 until 2009 of companies listed on the German DAX, MDAX, and SDAX. These three indexes include the 130 biggest listed German companies, and our tests are based upon at least 239 firm-year observations.

We focus on Germany for a number of reasons. First, most of the present literature is based on Anglo-Saxon settings (US, Canada and UK); we extend the empirical evidence to other institutional contexts (see also Reverte, 2009). Germany provides an interesting setting; CSR disclosure in Germany is generally voluntary; other European countries (such as the UK, France, Denmark and the Netherlands) have specific requirements regarding CSR disclosures. Second, Germany’s business culture is – similar to other Continental-European and Nordic countries – relatively stakeholder-oriented. This may affect the type, amount and impact of CSR-disclosures (Dhaliwal et al., 2012). Third, previous studies (e.g. Cormier et al., 2005; Gamerschlag et al., 2011) have discussed the determinants of CSR disclosure in Germany; we extend this line of literature by focusing on the financial consequences of CSR disclosures in the German institutional setting. In addition to the annual report, we include a broader set of reports that German companies use to communicate with shareholders (including voluntary CSR reports and other CSR specific disclosures in for example environmental, social, and human capital reports).

In brief, our results indicate that CSR information is value relevant; however, this relevance depends on the type of information. The provision of a CSR report is positively
associated with firm value. In addition, our overall CSR disclosure variable is positively yet only marginally significant associated with firm value. We find no (and sometimes a negative) association between our environmental disclosure proxies and stock prices. Potential reasons for this lack of association may be that such disclosures relate to assets as well as liabilities, that they signal legitimacy strategies, or that they signal “overinvestments” in environmental activities. On the other hand, our proxy for social disclosure is positively associated with firm value. The social disclosures therefore appear to explain the association between CSR reports, overall CSR disclosure and firm value. The relevance of social disclosures may be due to the fact that such disclosure provide information on companies’ workforce (i.e., the human capital of the firms or good relations with the labor unions) or that they signal an adequate risk management strategy. Overall, our findings suggest that both economic as well as socio-political theories may be helpful in explaining the consequences of specific CSR disclosures.

The article is structured as follows: in the next section, we review the relevant theory and derive our hypotheses. Section 3 contains the study design and the methodology, while section 4 presents our results. The study concludes with a summary, limitations of our study and potential avenues for future research.

2 Background literature and hypotheses

2.1 CSR activities and CSR disclosures

Corporate social responsibility (CSR) refers to a company’s voluntary contribution to sustainable development which goes beyond legal requirements (e.g., Carroll, 1999; De Bakker
et al., 2005; Crane and Matten, 2007). Business organizations are increasingly viewed as being accountable for their social and environmental impacts (Brammer & Pavelin, 2006). Some economists (e.g., Friedman, 1962; Levitt, 1970) argue that CSR activities should not be a company’s objective; companies should only act in a socially responsible way if the related activities lead to increased economic profits (Garriga and Melé, 2004). Other authors, generally relying on the managerial branch of stakeholder theory, argue that CSR activities might actually increase economic profits (e.g. Waddock and Graves, 1997; Dixon-Fowler et al., 2012; Dyllick and Hockerts, 2002; Mackey et al., 2007; Porter and Kramer, 2006; Epstein and Roy, 2001). Finally, a third stream or researchers (generally based in the ethical branch of stakeholder theory) suggests that the ethical treatment of stakeholders may require that the economic motive of organizations could be tempered to take account of the moral role of organizations and their social effects on people’s lives (Deegan & Unerman, 2006; Donaldson & Preston, 1995; Stoney & Winstanley, 2001). Despite more than 30 years of research, the results on the relation between a firm’s CSR activities and its financial performance is still mixed although most studies point towards a positive relationship (Garcia-Castro et al., 2010; Orlitzky et al., 2003; Margolis & Walsh, 2003).

Considering the potential impact of CSR activities on financial performance, investors and other financial market participants demand that companies voluntarily provide more comprehensive information about their long-term strategies and business models, and the drivers of value for today’s business (Cohen et al., 2012). The demand for enhanced disclosures has been further fueled by the increasing popularity of the stakeholder approach that has resulted in a widespread realization that the interactions of a company are not limited to just shareholders (Boesso & Kumar, 2007). Companies usually inform stakeholders of their CSR activities in the
annual report or in separate CSR reports (Dhaliwal et al., 2011; Reverte, 2009). However, there is no standardization or uniformity in terms of the items reported, or the way of reporting. Various NGO’s have started to develop models or frameworks for reporting on CSR, including the Internationally Standards Organization (ISO 14001), the World Resources Institute (WRI) and the Global Reporting Initiative (GRI).

2.2 Theoretical perspectives on CSR disclosures

Despite previous research on CSR disclosures, a comprehensive theoretical framework of the impact of CSR disclosures is still elusive (Reverte, 2009). Most studies in this area rely on economic theories (mostly agency theory and voluntary disclosure theory) and socio-political theories (including political economy, legitimacy theory, and stakeholder theory; see Reverte, 2009 and Clarkson et al., 2008).

Economic theory (specifically voluntary disclosure theory; Verrecchia, 1983) suggests a positive association between CSR disclosures and stock market performance. The underlying notion is that voluntary CSR disclosures provide incremental information beyond current financial performance that helps investors to assess competitiveness and expected future firm performance based upon the firm’s (CSR) strategy (Clarkson et al., 2013). Good CSR performers over-comply with current CSR regulations, and poor CSR performers engage in minimum compliance expenditures. Over-compliance with CSR regulations has been argued to create ‘green goodwill’, which includes cost advantages due to process innovation, the creation of insurance-like moral capital which can temper penalizing reactions in case of a negative event
(Aras and Crowther, 2009; Godfrey, 2005; Jo and Na, 2012; Mishra and Modi, 2012), the establishment of customer loyalty and market share in case of positive events (Blacconiere and Patten, 1994; Godfrey et al., 2009; Holder-Webb et al., 2009; Luo and Battacharya, 2006), and the increase of rivals’ costs (Clarkson et al., 2013). On the other hand, poor CSR performers do not enjoy these benefits but instead face obligations to incur future CSR expenditures with no incremental returns to shareholders as CSR standards get tougher (Clarkson et al., 2013). Good CSR performers signal their performance through the market with voluntary CSR disclosures that cannot be easily mimicked by poor CSR performers; this line of reasoning suggests that voluntary CSR disclosures increase firm value (Clarkson et al., 2013; Richardson & Welker, 2001). Empirical evidence seems at least partially consistent with economic theory predictions: several studies have documented that environmental disclosures are positively associated with share price (e.g. Clarkson et al., 2013), and that environmental performance is positively associated with environmental disclosure (Al-Tuwajri et al., 2004). Plumlee et al. (2010) find an inverse association between the quality of voluntary environmental disclosures and the cost of capital for US firms, and Dhaliwal et al. (2011) find that US firms which initiate CSR reports (a proxy for increased CSR disclosure) enjoy lower cost of capital.

Contrary to economic theories, socio-political theories (including legitimacy theory and stakeholder theory) predict a negative association between CSR disclosures and financial performance. Legitimacy theory recognizes that businesses are bound by the social contract with society in which the firm agrees to perform various socially desired actions in return for approval of their objectives and other rewards, and this ultimately guarantees their continued existence (Reverte, 2009). Prior studies in this domain have provided evidence that firms voluntarily
disclose information in their annual reports as a strategy to manage their legitimacy (e.g. Patten, 1991; Deegan & Rankin, 1996; Deegan & Gordon, 1996). Stakeholder theory explicitly considers the expectations impact of the different stakeholder groups within society upon corporate disclosure policies (Reverte, 2009). Under the managerial branch of stakeholder theory, the central thesis that emerges is that corporate disclosure is a management tool for managing the informational needs of the various powerful stakeholder groups (employees, shareholders, public authorities, etc). Managers use information to manage or manipulate the most powerful stakeholders in order to gain their support, which is required for survival (Gray et al., 1995). As poor CSR performers face more political and social pressures and threatened legitimacy, they will attempt to increase discretionary CSR disclosures to change stakeholder perceptions (Clarkson et al., 2008; Hughes et al., 2001).

Unlike economic theories, socio-political theories make no assumptions of rational, wealth-maximizing individuals operating within the environment of efficient capital markets (Reverte, 2009). Therefore, under the socio-political perspective, voluntary CSR disclosures may be regarded as providing either no incremental information to investors (as the provided CSR information is salient only to other stakeholders) or providing evidence of latent environmental liabilities (‘greenwashing’). Previous evidence (e.g. Deegan & Gordon, 1996) suggests that CSR disclosures are mostly self-laudatory, with companies promoting positive aspects of CSR performance yet failing to disclose negative aspects. Some empirical studies find results consistent with socio-political predictions; for example, Murray et al. (2006) indicate that CSR disclosures of the UK’s largest companies are unrelated to their financial market performance.
Richardson & Welker (2001) find a positive association between an environmental disclosure index and the cost of capital for US firms.

### 2.3 Hypotheses development

We extend the previous studies by focusing on the value relevance of voluntary CSR disclosures in a country which is relatively more stakeholder-oriented (i.e., Germany). Our setting is therefore different from the Anglo-Saxon countries that have been the focus of previous research. Economic theories suggest that companies have incentives to disclose ‘good CSR performance’ to differentiate themselves from companies with ‘bad CSR performance’ (Clarkson et al., 2013). Good CSR performers will seek to reveal their CSR performance, which is not directly observable to investors and other stakeholders, through voluntary CSR disclosures that cannot be easily mimicked by poor CSR performers. Investors will use the voluntary CSR disclosures for their investment decisions if the information is considered (1) relevant and (2) reliable (Barth et al., 2001; Wyatt, 2008). Socio-political theories indicate CSR information may not meet those requirements (e.g. Gray et al., 1995) for a number of reasons. First, CSR information may lack relevance to shareholders as it is directed towards other stakeholders. Second, CSR information may not be reliable as companies whose social legitimacy is threatened have incentives to change perceptions (not necessarily activities) about CSR performance, deflect attention from the issue of concern by highlighting other accomplishments, and seek to change public expectations of their CSR activities (Gray et al., 1995; Lindblom, 1994).
Despite the arguments from socio-political theories, we follow previous empirical evidence on Anglo-Saxon firms that generally predicts a positive relationship between CSR disclosures and firm value (Clarkson et al., 2013; Dhaliwal et al., 2011; Plumlee et al., 2010). Our key argument is that CSR information appears to be at least partially relevant to investors, and that this information is more likely to be relevant in stakeholder oriented countries (such as Germany; see Dhaliwal et al., 2012). This results in our first hypothesis:

H1: Voluntarily disclosed CSR information is positively associated with firm value.

One of the reasons that previous research has provided mixed results is that the value relevance of CSR information may differ across the categories and in different institutional settings. For example, Richardson & Welker (2001) find a positive association between an overall CSR disclosure and cost of capital for Canadian companies. On the other hand, Dhaliwal et al. (2011) find a negative association between the initiation of a CSR report and cost of capital for US companies1. Some studies suggest that the value relevance of CSR disclosures not only differs across institutional environments, yet also differs amongst CSR categories. Plumlee et al. (2010) find different associations between specific CSR disclosures (‘hard’ versus ‘soft’, and ‘positive’ versus ‘negative’) and the cost of capital in US companies. Campbell and Slack (2010) find that sell-side analysts often ignore environmental narratives and regard them as perfunctory obligations. Cho et al. (2012) find different associations between ‘strengths’ and ‘concerns’ in environmental reporting and information asymmetries, suggesting that environmental concerns are more likely to affect information asymmetries.

1 Canada is considered as more stakeholder oriented relative to the US; see Dhaliwal et al., 2012).
Finally, literature indicates that the association between CSR performance and share prices differs across specific categories. For example, Hillman & Keim (2001) suggest that environmental performance has a negative (yet insignificant) association with market value, while employee relations have a positive (yet insignificant) association with market value. Similarly, Bird et al. (2007) find that higher environmental ratings are negatively associated, yet higher diversity and employee ratings are positively associated on stock price returns. Bird et al. (2007) argue that market participants recognize the need to satisfy regulatory requirements but punish companies that expend corporate resources on environmental activities beyond those necessary to meet the minimum requirements, yet that the market rewards a ‘good employer’ as this helps to build human capital (see also Edmans, 2011).

As CSR is multidimensional (Hillman & Keim, 2001), disaggregation of CSR disclosures is necessary to better understand the relationships between specific CSR disclosures and stock prices in different institutional settings. We argue that the value relevance of CSR disclosures may differ across environmental and social (employee) categories. First, CSR disclosures on environmental aspects may discuss assets as well as liabilities; even though the last category may be framed in a positive way, they are likely to be received somewhat differently than information on employees. As we lack a proxy for actual environmental performance in our sample (Clarkson et al., 2013; Al-Tuwariji et al. 2004), our proxy for environmental disclosure is more likely to pick up the liability side of environmental disclosures. In addition, social (employee) disclosures are more likely to be considered as intangible assets (rather than liabilities) as they may provide information on human capital (Surroca et al., 2010). The last category of disclosures is especially likely to be important in Germany, where the labor unions have a
substantial say in corporate practices. In other words, more social disclosures may signal good labor union relations to the market. Third, a number of studies (e.g. Cho & Patten, 2007) suggest that environmental disclosures may be used to gain legitimacy (‘greenwashing’); this suggests that the credibility of these disclosures is limited, and that shareholders (and other stakeholders) would not react, or even react negatively, to such information. Due to the type of information, such ‘greenwashing’ is less likely to apply to social disclosures. The previous review results in our second set of hypotheses:

H2a: Voluntarily disclosed environmental CSR information are negatively associated with firm value.
H2b: Voluntarily disclosed social CSR information is positively associated with firm value.

3 Study design and methodology

3.1 Sample selection

Our analysis focuses on Germany for three reasons: comparability (i.e. exclusion of institutional differences), the voluntary disclosure environment, and the institutional environment. Previous literature suggests that CSR disclosure as well as their perception by shareholders and other stakeholders differ between countries (Dhaliwal et al., 2011; Matten and Moon, 2008; Orij, 2010; Van der Laan-Smith et al., 2005, 2010). Consequently, we concentrate on companies from an identical political and societal background. We chose Germany as it has no official regulations determining how the voluntary reporting on social and environmental aspects should be undertaken; however, German companies’ stakeholders might be specifically
sensitive with regard to CSR matters given that unions and other employee-related groups, such as work councils, are very powerful. Furthermore, environmental lobby groups have been monitoring German companies since the 1980s and try to impose sanctions on firms with perceived high environmental impacts.

We focus on companies listed on the German DAX, MDAX, and SDAX. These three indexes include the 130 biggest listed German companies. Our sample focuses on the index composition at the end of 2008; we include four reporting periods (2005 until 2008), and only reports provided in English have been included in the analysis (all companies in the sample provide their reports in English as well as in German). Since some companies’ reports are not available for all the years (e.g., if a company entered one of the indices after 2006 it is not included), our sample has been reduced by 36 observations. Furthermore, we lose 114 observations due to other missing information (e.g., Thomson One Banker does not list the net income of companies in certain industries). Our final data set consists of a total of 370 firm-year observations.

3.2 Content analysis

In this analysis, we are interested in the narrative CSR disclosures that companies provide to their stakeholders. Similar to previous studies (e.g. Clarkson et al., 2013; Richardson & Welker, 2001), we use content analysis to quantify the amount of CSR information in the reports. Content analysis is a method of codifying written text into various groups or categories on the basis of selected criteria. This analysis assumes that frequency is an indication of the subject matter’s importance (Beattie & Thomson, 2007; Guthrie et al., 2004; Krippendorff, 2004). Its
objective is to generate a numerically based summary of a chosen message set (Krippendorff, 2004; Neuendorf, 2002). The existing literature (e.g. Deegan and Gordon, 1996; Déjean and Martinez, 2009; Guthrie et al., 2004; Guthrie and Farneti, 2008; Guthrie and Parker, 1989) suggests that content analysis provides valid results for corporate social and environmental reporting research, allowing the researcher to evaluate the extent of various items’ disclosure.

A key issue in content analysis is the unit of analysis (Beattie & Thomson, 2007). A unit is an identifiable communication component through which variables are measured (Holsti, 1969; Krippendorff, 2004; Neuendorf, 2002). Depending on the unit of analysis, there are several ways of applying content analysis, for instance, by counting words, sentences or sections, or by reading the whole text (Neuendorf, 2002). We use words as the unit of analysis to reduce complexity in coding and to obtain an objective measure (Beattie & Thomson, 2007). We use the PDF reader’s word count function after checking its validity manually.

We apply a coding framework based on the global reporting initiative (GRI)’s framework. The GRI is regarded the most relevant institution in the CSR disclosure context (Moneva et al., 2006), ranks among the most widely recognized CSR instruments among large European companies (European Commission, 2013), and is often referred to as a global standard. Owing to the guidelines’ voluntary nature, organizations have the flexibility to decide which information to disclose. The GRI guidelines cover all aspects of CSR, as they consider an economic, environmental, and a social perspective. Since companies are obliged to disclose

---

2 Beattie & Thomson (2007, p. 135-145) discuss specific issues which are relevant in using content analysis to investigate narrative disclosures in annual reports. These include boundary definitions and coding reliability, manual vs electronic searching, annual report material analyzed, volume of disclosures, location and type of disclosure, and unit of analysis. Each of these issues is discussed in this section.
financial, and thus economic, information, we only incorporate the environmental and social perspectives in our coding framework. The GRI guidelines provide indicators of all three CSR perspectives. These indicators can be classified into core indicators and additional ones. Core indicators are of interest to most stakeholders, and are therefore relevant for most companies, while additional indicators are only of interest to some stakeholders and companies (GRI, 2010). We derive the final 32 keywords for our analysis from the core indicators by defining one or more keywords for every indicator; Table 1 provides the keywords as well as some examples from corporate reports.

We focus on reports provided on the companies’ websites. In general, there are different ways of disclosing information on CSR. First, companies may integrate CSR-related aspects into their annual/financial reports by enhancing these reports. Second, companies may provide separate CSR, environmental, social, human capital or sustainability reports (in addition to their annual reports). Finally, companies may use other media, for example, press releases, to disclose CSR-related information. In our analysis, we concentrated on the first two options, thus taking two of the most important communication channels for CSR disclosure into account.

3.3 Valuation model

In line with previous studies (e.g., Clarkson et al., 2013; Hassel et al., 2005; Lourenco et al., 2011; Richardson & Welker, 2001), we estimate the following Ohlson (1995) valuation model:
\[ SP_{i,t} = \beta_0 + \beta_1 BVE_{i,t} + \beta_2 NI_{i,t} + \beta_3 CSRDISC_{i,t} + \sum \beta_n CONTROLS_{i,t} \]  

(1)

where \( SP \) is the share price (of common shares) at the end of the quarter when all relevant reports have been published\(^3\); \( BVE \) is the book value per share at the end of the fiscal year; \( NI \) is the net income per share at the end of the fiscal year; \( CSRDISC \) is a CSR disclosure score over the fiscal year (the CSR disclosures provided in either the annual report or the CSR report); and \( CONTROLS \) include industry and year dummies.

An alternative approach to assessing value relevance is the return-based approach (Barth et al., 2001). In line with previous literature (e.g. Barth et al., 2001), we also estimate the following model:

\[ RET_{i,t} = \beta_0 + \beta_1 DNI_{i,t} + \beta_2 NI_{i,t} + \beta_3 DCSRDISC_{i,t} + \sum \beta_n CONTROLS_{i,t} \]  

(2)

where \( RET \) is the return per share over the year ending at the end of the quarter when all relevant reports have been published; \( DNI \) is the change in the net income per share over the fiscal year; and \( DCSRDISC \) is the change in the CSR disclosure index over the fiscal year. \( NI \) and \( CONTROLS \) are as previously defined. We obtain data on share prices from Thomson One Banker; data on dividends (required to calculate the annual returns) are obtained from the website of Deutsche Boerse AG.

We use a number of proxies for the CSR information provided by firms. Our first variable of interest is whether companies provide a separate CSR report (denoted CSRR), as previous literature (e.g. Dhaliwal et al., 2011) indicate that companies that issue a CSR report are more likely to provide incrementally useful information for investors to evaluate a firm’s long-
term sustainability. CSRR is a dummy variable that indicates whether or not a separate CSR report is provided in the corresponding year (‘1’ indicates a separate report and ‘0’ otherwise). In addition, we compute three other key disclosure variables\textsuperscript{4} that focus on the amount of CSR information provided by companies: CSRTOT is the total quantity of CSR disclosures (i.e., the total number of words on CSR topics based on the list in table 1a in the annual report and the CSR report), CSRENV is the amount of environmental disclosures, and CSRSOC is the amount of social disclosures. To prevent that CSR proxies for more disclosures in other areas (i.e., other financial or nonfinancial disclosures), we divide the number of observed words by the number of pages in both the annual report and the CSR report. Thus, we obtain a relative index indicating the number of ‘CSR hits per page’ in the corresponding category. For the return model, we use the change in disclosure for consecutive years in each of the CSR categories (for example, DCSRTOT = CSRTOT\textsubscript{t} – CSRTOT\textsubscript{t-1}).

As CSR disclosures are affected by industry membership (Cohen et al. 2012; Roberts, 1992), we use industry dummies (based on the classification from Deutsche Boerse) to distinguish between 18 different industries. In addition, we use year dummies to control for potential time effects.

4 Empirical results

4.1 Descriptive statistics

\textsuperscript{4} We evaluate the stability of our results by using other disclosure variables and methodologies in a number of robustness checks. Subsequent sections will discuss these robustness checks as well as the construction of the alternative variables.
Table 2 offers a summary of the variable definitions, the data sources, the descriptive statistics and the correlation matrix for the variables under consideration.

Table 2, panel A, indicates that there is considerable variation in the variables under consideration. Approximately 17% of the companies in our sample provide a separate CSR report; the number of separate CSR reports has increased from 14 in 2006 (13%) to 26 in 2009 (21%). The absolute number of CSR related words has increased from 10,050 hits in 2006 to more than 21,650 hits in 2009. The average number of words on CSR per page in the annual report and the CSR report (CSRTOT) is 0.63 for the whole sample. Despite an increase in the average number of pages in the analyzed reports\(^5\), the scores for the variables CSRTOT (CSRENV, CSRSOC) have increased from 0.50 (0.25, 0.23) in 2006 to 0.71 (0.33, 0.37) in 2009. The previous result suggests that disclosures on CSR related topics have increased in importance relative to other topics in the annual report\(^6\). Consistent with previous research (Reverte, 2009; Brammer & Pavelin, 2006; Al-Tuwariji et al., 2004; Roberts, 1992) is that companies in industries with environmental sensitivities - utilities, automobile manufacturing, chemicals and construction - disclose more CSR information\(^7\).

\(^5\) On average, the total number of pages in the annual report and – if available - the CSR report have increased from 160 pages in 2006 to 204 pages in 2009.

\(^6\) An additional manual analysis of the disclosures indicates that nearly all disclosures have a positive tone. Companies hardly provide information on negative environmental impacts (for example, oil spills) or on poor human rights performance. If anything, this goes against finding a result if investors are skeptical to such ‘greenwashing’.

\(^7\) In addition, the telecommunications industry has a high amount of CSR disclosure; this industry is presented by just one company, and most of the disclosures relate to social CSR disclosures.
Table 2, panel B, shows the Pearson correlations. In addition to BVE and NI, the share price (SP) is positively associated with all CSR disclosures. In addition, the returns (RET) are positively associated with changes in some (DCSRTOT, DCSRSOC) yet not all CSR disclosures. Finally, (changes in) the disclosure indexes are highly correlated, suggesting that companies increase CSR disclosures in a number of areas rather than only in one area.

4.2 Regression model results

Results for our primary analyses are presented in table 3. Panel A presents the results for the share price model (Eq. (1)), and Panel B presents the results for the return model (Eq. (2)). The results are based on the pooled sample of 370 (239) firm-year observations for which both share price (returns) and the disclosure index (change in disclosure index) are available. All regression models include year dummies to control for year-fixed effects, and industry dummies to control for industry-fixed effects. Regression equations are estimated using pooled ordinary least squares (OLS) with White standard errors.

Our results for the share price model show that, consistent with our first hypothesis, the provision of a separate CSR report is significantly associated with share price (CSRR, p<0.10). The provision of more CSR information relative to other information in the annual report is positively, yet only marginally significant associated with share price (CSRTOT, p=0.16). Consistent with our second hypothesis is that the provision of more social information relative to other information is positively associated with share price (CSRSOC, p<0.01). The provision of
more environmental information relative to other information in the annual report is, by itself, not associated with share price (CSRENV, p>0.10). Jointly with social disclosures, the effect of CSRENV becomes negative, which confirms our second hypothesis.

The results for the returns model are mostly consistent with the findings from the share price model. A change in total disclosure (DCSRTOT) and environmental disclosure (DCSRENV) by itself does not have any impact on the returns; this result is inconsistent with hypothesis 1 and 2a. In addition, a change in social disclosure (DCSRSOC) has a marginal positive impact on the returns (β=0.14, p<0.15). The joint effect of a change in environmental and social disclosure is negatively yet not significant, respectively positively and significant associated with the returns (DCSRENV: β=-0.10, p>0.20  DCSRSOC: β=0.22, p<0.10); this is consistent with hypothesis 2. The combined results of the share price and the returns model suggest that disclosing more information on social (employee) related issues can enhance stock price, while disclosing more information on environmental issues may not affect – or even decrease – stock price.

4.3 Robustness checks

We perform a number of stability checks to evaluate the robustness of our findings. First, we consider the effect of the time period by discussing the (untabulated) results for each of the two models (share price model, returns model) run by year (2005 until 2009). Our results are somewhat different from the results presented previously: first of all, having a CSR report (CSRR) does not affect stock price performance, except for the last year. The total level of CSR disclosure (CSRTOT) is not significant for the first three years, yet highly significant in 2009.
The total level of environmental disclosures (CSRENV) is either negative (2007) or not significant (other years), while the level of social disclosures (CSRSOC) is positive and significant (p<0.10), with the exception of 2006. The returns specification provides similar results: a change in total disclosure (DCSRTOT) is not associated with returns, with the exception of 2009; a change in environmental disclosure (DCSRENV) is negatively (in 2008) or not associated with returns, while a change in social disclosure (DCSRSOC) is not or positively associated with returns. While part of this result may be explained by macro-economic developments and stock price movements over the years\textsuperscript{8}, it may also indicate that the disclosure of CSR information may be part of an effective risk management strategy (Godfrey et al., 2009; Husted, 2005): firms with more (social) CSR disclosures are less vulnerable to stock price declines and economic downturns, and appear to have better foresights when the economy picks up. Overall, the year-by-year results are generally consistent with the results based on the pooled sample, although the results in 2006 are somewhat weaker and the results in 2009 are stronger.

In a second set of tests, we evaluate whether our results are affected by the disclosure measure. In our original test, we count the total number of words related to CSR (based on the GRI guidelines) in both the CSR report and the annual report, and divide our score by the total number of pages in the CSR report and the annual report (to correct for other information provided in the annual report). As an alternative disclosure measure, we use a dichotomous measure that is equal to one if one of the words in table 1a is mentioned in either of the reports, and zero otherwise (similar to Botosan, 1997). We summate the scores for this dichotomous

\textsuperscript{8} The DAX index, the index for the main German Stock Exchange, increased during 2006 and 2007, declined during 2008, and increased again during 2009. On the other hand, the economy had a growth averaging 2.3% during 2006-2008, yet Germany’s economy contracted by 5% in 2009 (see Ahearn & Belkin, 2010).
measure to obtain the measure for total disclosure, and split it into separate measures for environmental and social disclosures. This new disclosure measure (CSRXXXDI) does not award multiple points for multiple references to the same disclosure item; it does not capture the relative importance of the CSR element, either. The results for the dichotomous measure are similar to the results presented previously: the total disclosure is marginally significant (CSRTOTDI: $\beta=0.40$, $p<0.12$), while the environmental disclosure measure (CSRENVDI) is not significant and the social disclosure measure (CSRSOCDI) is marginally significant in a regression including CSRENVDI ($p<0.15$; CSRENVDI is positive, yet not significant) and positive and significant ($p=0.10$) in a standalone regression (excluding CSRENVDI). In addition, we replicate our tests using the absolute number of words on each of the CSR topics. Using the total number of words on a topic indicates the subject matter’s importance (Davison, 2008; Guthrie et al., 2004) as it provides emphasis and memorability. Our tests using the absolute number of words on the CSR topics are similar to the results presented previously: environmental disclosures are not associated with stock prices, while social disclosures are positively associated with stock prices.

Finally, we use the Ramsey RESET-test (Verbeek, 2004) to see whether the results may suffer from omitted variable bias or other misspecification errors. The results (non-tabulated) indicate that this is not the case for the returns model (Eq. (2)), yet that the share price model (Eq. (1)) may suffer from inadequate model specification. As a remedy, we run a two-stage-least-squares (2SLS) regression. We use a number of instrumental variables that have been shown to affect disclosure levels in previous literature (e.g. Reverte, 2009; Boesso & Kumar, 2007; Al-Tuwajiri et al., 2004): visibility (proxied by the log of the number of hits found for the
companies’ names at www.handelsblatt.com, a German financial newspaper site), size (proxied by the number of full time equivalents working in the company), freefloat (a proxy for shareholder structure measured by the percentage of common shares that is traded in the open market), and US listing (the importance of relations with US stakeholders measured by means of a dummy for US listing). The results (non-tabulated) from the 2SLS model are similar to the results presented previously: the provision of a CSR report (CSRR) is positively associated with the share price (p<0.10). The provision of CSR information (CSRTOT) is marginally associated with share price (p<0.15), while the provision of social (environmental) information is positively (negatively) associated with the share price when jointly entered into the regression (CSRENV: p<0.10; CSRSOC: p<0.01). When entered separately, the results for social (environmental) information is positively (not significant) associated with share price. Overall, our conclusions based on alternative specifications of our models, disclosure indices and over the years are similar to the tabulated results.

5 Summary and conclusions

Establishing the value relevance of voluntary CSR disclosures is of importance to both practitioners as well as to academics. Previous empirical evidence (Clarkson et al., 2013; Dhaliwal et al., 2011; Murray et al., 2006; Richardson & Welker, 2001), mostly from a shareholder-oriented setting (US, UK, Canada), provides mixed results on the relation between CSR disclosures and stock price performance. We revisit this relation and seek to advance the literature in this area by testing the value relevance of CSR disclosures in a context in a stakeholder-oriented setting (i.e., Germany). We distinguish between different aspects of CSR disclosures (i.e., environmental versus social disclosures) as specific stakeholder groups may
have dissimilar influences on firms’ operations and financial performance (Dhaliwal et al., 2012).

We find that the provision of a separate CSR report is positively associated with stock prices. Further tests reveal that this positive association is mostly due to the provision of social (i.e., employee-related) disclosures; the provision of environmental disclosures has either no impact, or potentially even a negative impact on stock prices. The latter results suggest that the provision of more narrative CSR disclosures to tailor specific stakeholder needs (e.g. environmental NGO’s) may come at the expense of another stakeholder group (e.g. shareholders), and firms should be aware of such trade-offs when designing their CSR disclosure policy. In addition, the positive effects for social CSR disclosures and stock price are stronger in specific years (i.e., when the economy contracts yet stock prices increase in anticipation of economic recovery). One potential explanation is that social CSR disclosures provide an indication of the human capital of the firm, which subsequently drives future financial performance (Surroca et al., 2010). Alternatively, CSR disclosures may be part of a risk management strategy that tempers (economic) downside risk (Cho et al., 2012; Godfrey et al., 2009; Husted, 2005).

Our study has several limitations. First, our results do not control for actual environmental or social performance as such measures are not available for our sample. Although the exclusion of actual environmental and social performance is consistent with other studies in this area (e.g. Dhaliwal et al., 2012, 2011), other studies find that environmental performance measures have an impact upon financial performance (e.g. Clarkson et al., 2013; Al-Tuwaijiri et al., 2004). Our finding that environmental CSR disclosures are not associated with performance may be explained by the fact that these disclosures capture both assets as well
as liabilities (while the last one may be captured by actual environmental performance in other studies), that they signal legitimacy strategies (which may be more adequately explained by social theories), or that they signal “overinvestments” in environmental activities. Second, our study focuses on firms listed on the German stock exchange. In addition to the institutional setting, our analysis is based on the industry classification that is provided by Deutsche Boerse (the German stock exchange). This industry classification is more detailed and deviates from industry classifications in previous Anglo-Saxon studies, which may affect both the results as well as comparability with Anglo-Saxon studies. In addition, some measures were not available for all industries, which reduced our sample size; the exclusion of companies from some industries may have also biased our results.

Another limitation is that our inferences are based on a narrative measure for disclosure based on keywords as a unit of analysis; this methodology may be criticized as words are detached from their textual background. Deriving the keywords for the content analysis from the GRI guidelines is not free of risk, as the guidelines might not capture all of the relevant CSR aspects (Moneva et al., 2006). Even though we account for unusual disclosure scores in some reports, control for other information in the report and perform additional checks to evaluate the robustness of our disclosure index, we are aware that our methodology may affect our results. In addition, our methodology only captures narrative disclosures; it does not capture alternative communication formats such as visual images (Davison, 2008) nor differences in font choice, size, boldness, or color and alternative locations in the annual report that could be used to stress the importance of the item being disclosed (Beattie & Thomson, 2007). Finally, cultural aspects may also affect our results since our results are from one country, which affects the
generalizability of our findings. Additional research along these lines may provide interesting insights.

In addition to the above noted limitations, our results provide interesting avenues for future research. For example, CSR disclosures in different categories could serve different roles for future performance improvements and risk management purposes; additional research may try to disentangle these relationships. Further research may also address the question whether there is an optimum regarding CSR information disclosure; more information may not always be better. Finally, future research could investigate the impact of CSR disclosures on different stakeholders (e.g. such as employee motivation, see Edmans, 2011; or customer satisfaction, see Luo & Bhattacharya, 2006). Considering only the share price implications might not be sufficient to understand the mechanisms through which CSR disclosures could affect future financial performance.
REFERENCES


Holsti, O.R.: 1969, Content analysis for the social sciences and humanities (Addison-Wesley, Reading, MA).


Table 1: Keywords and relevant quotes

Table 1a: Keywords for the content analysis derived from the GRI framework

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Environmental</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycled</td>
<td></td>
<td>Employment</td>
</tr>
<tr>
<td>Energy consumption</td>
<td></td>
<td>Employee turnover</td>
</tr>
<tr>
<td>Biodiversity</td>
<td></td>
<td>Collective bargaining</td>
</tr>
<tr>
<td>Emissions</td>
<td></td>
<td>Collective agreements</td>
</tr>
<tr>
<td>Effluents</td>
<td></td>
<td>Occupational health</td>
</tr>
<tr>
<td>Waste</td>
<td></td>
<td>Occupational safety</td>
</tr>
<tr>
<td>Spills</td>
<td></td>
<td>Training</td>
</tr>
<tr>
<td>Environmental impacts</td>
<td></td>
<td>Diversity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Equal opportunities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Human rights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discrimination</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freedom of association</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Child labor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Forced labor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compulsory labor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Community</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Corruption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Public policy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compliance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sanctions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Product responsibility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customer health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customer safety</td>
</tr>
</tbody>
</table>

Table 1b: Relevant quotes from annual reports

Example environmental keywords from Siemens Annual Report 2009, p. 61:
With the products and solutions in our Environmental portfolio, we intend to save energy and reduce greenhouse gas emissions – clearly the most effective measures at our disposal. We also want to make our own operations greener by cutting our CO2 emissions 20 percent by 2011 (compared to 2006) on a revenue-adjusted basis. A major lever here is our Green Building Initiative, which will help us reduce energy consumption, water consumption and waste at our most important locations 20 percent by 2011.

Example social keywords from BMW Annual Report 2009, p. 27:
Basic and further training tailored to requirements
As a premium provider, we attach great importance to both the basic and the further training of our workforce. The creation of a training academy clearly demonstrates our commitment to training and education within the company. Training opportunities are made available to our German and British employees at the academy. Basic and further training courses are tailored to suit current requirements and implemented with specific objectives in mind. In the face of difficult business conditions, further training activities in 2009 were focused on selected target groups and specific priority topics. Expenditure on basic and further training totalled euro 143 million in the financial year 2009 (− 7.1 %).
### Table 2: Descriptive and correlation statistics

#### Table 2, Panel A: Variable definitions and descriptive statistics

<table>
<thead>
<tr>
<th>Measure</th>
<th>Explanation</th>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>Share price three months after the end of the fiscal year</td>
<td>Thomson One Banker</td>
<td>478</td>
<td>35.76</td>
<td>33.97</td>
<td>1.69</td>
<td>183.90</td>
</tr>
<tr>
<td>RET</td>
<td>Return per share (incl. dividend payments) three months after the end of the fiscal year</td>
<td>Thomson One Banker</td>
<td>463</td>
<td>0.01</td>
<td>0.52</td>
<td>-0.87</td>
<td>1.80</td>
</tr>
<tr>
<td>BVE</td>
<td>Book value of equity per share at the end of the fiscal year</td>
<td>Thomson One Banker</td>
<td>470</td>
<td>19.10</td>
<td>17.57</td>
<td>1.21</td>
<td>87.49</td>
</tr>
<tr>
<td>NI</td>
<td>Net income per share over the fiscal year</td>
<td>Thomson One Banker</td>
<td>371</td>
<td>3.51</td>
<td>4.89</td>
<td>-4.54</td>
<td>25.30</td>
</tr>
<tr>
<td>DNI</td>
<td>Net income per share over the fiscal year minus net income per share over the previous fiscal year</td>
<td>Thomson One Banker</td>
<td>252</td>
<td>-0.17</td>
<td>3.16</td>
<td>-13.00</td>
<td>7.74</td>
</tr>
<tr>
<td>CSRR</td>
<td>Dummy for provision of separate CSR report (1 if CSR report is provided, 0 otherwise)</td>
<td>Downloaded from the company’s website</td>
<td>484</td>
<td>0.17</td>
<td>0.38</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>CSRTOT</td>
<td>Total number of CSR words mentioned in the reports, divided by the number of pages of the CSR report and the annual report</td>
<td>Provided reports</td>
<td>484</td>
<td>0.62</td>
<td>0.55</td>
<td>0.05</td>
<td>2.78</td>
</tr>
<tr>
<td>CSRENV</td>
<td>Total number of CSR words related to environmental aspects mentioned in the reports, divided by the number of pages of the CSR report and the annual report</td>
<td>Provided reports</td>
<td>484</td>
<td>0.30</td>
<td>0.31</td>
<td>0.00</td>
<td>1.51</td>
</tr>
<tr>
<td>CSRSOC</td>
<td>Total number of CSR words related to social (employee-related) aspects mentioned in the reports, divided by the number of pages of the CSR report and the annual report</td>
<td>Provided reports</td>
<td>484</td>
<td>0.32</td>
<td>0.31</td>
<td>0.03</td>
<td>1.77</td>
</tr>
<tr>
<td>DCSRTOT</td>
<td>CSRTOTt minus CSRTOTt-1</td>
<td>Provided reports</td>
<td>356</td>
<td>0.08</td>
<td>0.45</td>
<td>-1.21</td>
<td>1.73</td>
</tr>
<tr>
<td>DCSRENV</td>
<td>CSRENVt minus CSRENVt-1</td>
<td>Provided reports</td>
<td>356</td>
<td>0.04</td>
<td>0.25</td>
<td>-0.68</td>
<td>1.10</td>
</tr>
<tr>
<td>DCSRSOC</td>
<td>CSRSOCT minus CSRSOCT-1</td>
<td>Provided reports</td>
<td>356</td>
<td>0.05</td>
<td>0.24</td>
<td>-0.66</td>
<td>1.09</td>
</tr>
<tr>
<td>Industry dummies</td>
<td>Industry classification based upon German stock exchange (Deutsche Boerse; dummies for 18 different industries)</td>
<td>Deutsche Boerse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2, Panel B: Correlation matrix**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.SP</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.RET</td>
<td>0.344**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.CSRR</td>
<td>0.250**</td>
<td>0.008</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.CSRTOT</td>
<td>0.171**</td>
<td>0.003</td>
<td>0.658**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.CSRENV</td>
<td>0.098*</td>
<td>0.013</td>
<td>0.442**</td>
<td>0.865**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.CSRSOC</td>
<td>0.213**</td>
<td>-0.014</td>
<td>0.700**</td>
<td>0.860**</td>
<td>0.510**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.DCSRTOT</td>
<td>0.148**</td>
<td>0.123*</td>
<td>0.379**</td>
<td>0.545**</td>
<td>0.530**</td>
<td>0.431**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.DCSRENV</td>
<td>0.110*</td>
<td>0.099</td>
<td>0.317**</td>
<td>0.531**</td>
<td>0.567**</td>
<td>0.362**</td>
<td>0.940**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.DCSRSOC</td>
<td>0.180**</td>
<td>0.120*</td>
<td>0.388**</td>
<td>0.488**</td>
<td>0.412**</td>
<td>0.492**</td>
<td>0.900**</td>
<td>0.724**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.NI</td>
<td>0.586**</td>
<td>0.139**</td>
<td>0.088</td>
<td>0.109*</td>
<td>0.088</td>
<td>0.106*</td>
<td>0.056</td>
<td>0.064</td>
<td>0.047</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>11.DNI</td>
<td>0.157*</td>
<td>0.264**</td>
<td>-0.050</td>
<td>-0.033</td>
<td>-0.023</td>
<td>-0.017</td>
<td>-0.060</td>
<td>-0.048</td>
<td>-0.053</td>
<td>0.319**</td>
<td>1.00</td>
</tr>
<tr>
<td>12.BVE</td>
<td>0.683**</td>
<td>0.029</td>
<td>0.268**</td>
<td>0.165**</td>
<td>0.115*</td>
<td>0.179**</td>
<td>0.094</td>
<td>0.090</td>
<td>0.093</td>
<td>0.777**</td>
<td>0.003</td>
</tr>
</tbody>
</table>

*,** = correlation is significant at the 5% respectively 1% level
Table 3: Regression results

Table 3, Panel A: share price model (Eq. (1))

<table>
<thead>
<tr>
<th>Model</th>
<th>Hyp. effect</th>
<th>Hyp.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>19,83 ***</td>
<td>18,35 ***</td>
<td>20,09 ***</td>
<td>18,14 ***</td>
<td>20,18 ***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NI</td>
<td>1,37 *</td>
<td>1,35 *</td>
<td>1,26 *</td>
<td>1,43 *</td>
<td>1,40 *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BVE</td>
<td>1,12 ***</td>
<td>1,14 ***</td>
<td>1,17 ***</td>
<td>1,09 ***</td>
<td>1,08 ***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSRR</td>
<td>H1 +</td>
<td>6,43 *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSRTOT</td>
<td>H1 +</td>
<td>3,79</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSRENV</td>
<td>H2a -</td>
<td>-0,39</td>
<td>3,79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSRSOC</td>
<td>H2b +</td>
<td>11,65 ***</td>
<td>16,05 ***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry dummies included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
</tr>
<tr>
<td>Year dummies</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
</tr>
<tr>
<td>N</td>
<td>370</td>
<td>370</td>
<td>370</td>
<td>370</td>
<td>370</td>
<td>370</td>
<td>370</td>
</tr>
<tr>
<td>R2</td>
<td>0,55</td>
<td>0,55</td>
<td>0,55</td>
<td>0,56</td>
<td>0,56</td>
<td>0,53</td>
<td>0,53</td>
</tr>
<tr>
<td>Adj R2</td>
<td>0,52</td>
<td>0,52</td>
<td>0,52</td>
<td>0,53</td>
<td>0,53</td>
<td>0,53</td>
<td>0,53</td>
</tr>
<tr>
<td>F-statistic</td>
<td>21,39</td>
<td>21,28</td>
<td>21,04</td>
<td>21,87</td>
<td>21,10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob (F-stat)</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
</tr>
</tbody>
</table>

Table 3, Panel B: Return model (Eq. (2))

<table>
<thead>
<tr>
<th>Model</th>
<th>Hyp. effect</th>
<th>Hyp.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0,16 **</td>
<td>0,17 **</td>
<td>0,16 **</td>
<td>0,16 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NI</td>
<td>0,01 ***</td>
<td>0,01 **</td>
<td>0,01 **</td>
<td>0,01 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNI</td>
<td>0,01 *</td>
<td>0,01 *</td>
<td>0,01 *</td>
<td>0,01 *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCSRTOT</td>
<td>H1 +</td>
<td>0,06</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCSRENV</td>
<td>H2a -</td>
<td>-0,04</td>
<td>0,04</td>
<td>-0,10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCSRSOC</td>
<td>H2b +</td>
<td>0,14</td>
<td>0,22 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry dummies included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
</tr>
<tr>
<td>Year dummies</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
<td>included</td>
</tr>
<tr>
<td>N</td>
<td>239</td>
<td>239</td>
<td>239</td>
<td>239</td>
<td>239</td>
<td>239</td>
</tr>
<tr>
<td>R2</td>
<td>0,43</td>
<td>0,43</td>
<td>0,44</td>
<td>0,44</td>
<td>0,44</td>
<td>0,44</td>
</tr>
<tr>
<td>Adj R2</td>
<td>0,38</td>
<td>0,38</td>
<td>0,39</td>
<td>0,39</td>
<td>0,39</td>
<td>0,39</td>
</tr>
<tr>
<td>F-statistic</td>
<td>8,82</td>
<td>8,69</td>
<td>8,92</td>
<td>8,50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob (F-stat)</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
</tr>
</tbody>
</table>

The share price model is described by Eq. (1) in the text, the returns model is described by Eq. (2). All analyses are based on the pooled sample of 370 (239) firm-year observations for which both share price (returns) and the disclosure index (change in disclosure index) are available. All regression models include year dummies to control for year-fixed effects, and industry dummies to control for industry-fixed effects.
Variable definitions: \( SP \) is Share price at the end of the quarter when all relevant reports have been published; \( RET \) is Return per share (incl. dividend payments) at the end of the quarter when all relevant reports have been published; \( BVE \) is Book value of equity per share at the end of the fiscal year; \( NI \) is Net income per share over the fiscal year; \( DNI \) is Net income per share over the fiscal year minus net income per share over the previous fiscal year; \( CSRR \) is a dummy for provision of separate CSR report (1 if CSR report is provided, 0 otherwise); \( CSRTOT \) is the total number of CSR words mentioned in the reports, divided by the number of pages of the CSR report and the annual report; \( CSRENV \) is the total number of CSR words related to environmental aspects mentioned in the reports, divided by the number of pages of the CSR report and the annual report; \( CSRSOC \) is the total number of CSR words related to social (employee-related) aspects mentioned in the reports, divided by the number of pages of the CSR report and the annual report; \( DCSRTOT \) is \( CSRTOT_t \) minus \( CSRTOT_{t-1} \); \( DCSRENV \) is \( CSRENV_t \) minus \( CSRENV_{t-1} \); \( DCSRSOC \) is \( CSRSOC_t \) minus \( CSRSOC_{t-1} \); Industry dummies are based on the industry classification based upon German stock exchange (Deutsche Boerse; dummies for 18 different industries).

\*, **, *** = significant at the 10%, 5% and 1% level (two-tailed).