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Environmental Disclosure Determinants in Dutch Listed Companies

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ABSTRACT

Previous studies have already reported mixed results on the relationship between corporate environmental disclosures and environmental performance. The purpose of this paper is to identify variables that impact significantly the level of environmental disclosure practices provided by Dutch listed firms. A content analysis scorecard is used to test the mentioned level. The scorecard is based on the Global Reporting Initiative sustainability reporting guidelines, developed by Clarkson, Li, Richardson, and Vasvari (2008) in collaboration with an environmental disclosure expert. It is one of the first studies that have applied this comprehensive scorecard. This method is valuable to users who seek to assess the firms' true environmental exposure. Furthermore, there are no published studies that examine variables in which it is possible to find a significant impact on the disclosure practices of Dutch companies. The environmental information for 2008 was collected from a sample of 28 Dutch listed companies, which ones represent 90% of the total market capitalization on the Dutch stock exchange, and the selected variables that could affect the level of environmental disclosure are firm size, industry membership and firm profitability. The statistical tests proved that firm size and industry membership are significantly and positively associated with the level of environmental disclosure. This result is consistent with prior research that has used other measures of environmental disclosure. However, profitability is not statistically significant related to the level of environmental disclosure. This may be due to the impact of the financial crisis that has arisen in 2007/2008.

Keywords: Global Reporting Initiative. Environmental disclosure. Sustainability reporting. The Netherlands. Content analysis.

1 INTRODUCTION

Societal awareness and concerns for the environmental impact of businesses have arisen to increase in about four decades ago. At this time, questions about issues affecting the natural environment were raised. According to Gamble, Hsu, Jackson, and Tollerson (1996), these issues include, in addition, movement of waste, emissions, protection of the ozone layer, toxic waste destruction, and climate change. Although the criticisms on the harmful environmental impact of organizations slightly faded in the 1980s, the 1990s represent a new focus of attention for this topic (Kolk, 2003). This renewed attention for the natural environment has not been isolated in a particular region or culture, but it has drawn global attention (Gamble, Hsu, Jackson, & Tollerson, 1996).

The trend in environmental awareness has led to a growing demand for environmental accountability by organizations. The corporate social responsibility (CSR) is a policy of an organization that identifies the concerns with society-related issues as: the environment, human resources, community involvement, and product safety (Roberts, 1992). Providing social or environmental disclosure is a method to explain CSR policies and to take responsibilities for ethical, social and environmental actions (Adams, 2004; Brammer & Pavelin, 2006). Since the mid-1990s, attention for environmental accounting related research has been increased. A popular field of research is related to the corporate and the country specific determinants of environmental disclosure (Bartiaux, 2008; Bassetto, 2010; Beck, Campbell, & Shrives, 2010; Buhr, 1998; Burritt & Welch, 1997; Christ & Burritt, 2013; Clarkson, Li, Richardson, & Vasvari, 2011; Cormier & Magnan, 2003; Cowen, Ferreri, & Parker, 1987; Deegan & Gordon, 1996; Dong, Ishikawa, Liu, & Hamori, 2011; Erlandsson & Tillman, 2009; Hackston & Milne, 1996; Harte & Owen, 1991; Kolk & Perego, 2010; Murray, Sinclair, Power, & Gray, 2006; Roberts, C. B., 1991; Roberts, R. W., 1992; Rosa, Ensslin, Ensslin, & Lunkes, 2012; Silva Monteiro & Aibar-Guzmán, 2010; Tilt & Symes, 1999; Trierweiller, Peixe, Tezza, Bornia, & Campos, 2012).

This study differs from comparable studies on three aspects. First, it examines the environmental disclosure determinants in the Netherlands. Most of the studies regarding corporate techniques of environmental disclosure are focused on Anglo-Saxon countries (Gray, Kouhy, & Lavers, 1995). Roberts (1991) states that Europe is especially interesting for research in environmental disclosure practices because it is the home of many active environmental groups, different types of accounting information systems are used there and the cultural attitudes towards social disclosure differ from others. Therefore, it is expected that the level of environmental disclosures will vary significantly across European countries (Gamble et al., 1996).

Second, prior empirical research is mainly focused upon the largest companies and industries identified as environmental polluting (Brammer & Pavelin, 2006). Another comparative advantage of this study is that in the sample both large and small firms (although listed) and both non-environmental and environmental polluting industries are included. As a result, this study is able to compare differences in environmental disclosure between larger and smaller firms and between more environmental polluting and less environmental polluting companies.

Third, this study differs from comparable studies on an important aspect, the measurement of environmental disclosure level. Other research has measured the level of disclosure by counting, for example, the number of words, sentences or pages in the annual report. After this, the relation between specific variables and the amount of disclosures are tested (Deegan & Gordon, 1996; Gray et al., 1995; Guthrie & Parker, 1989; Hackston & Milne, 1996; Milne & Adler, 1999; Neu, Warsame, & Pedwell, 1998; Patten, 2002). Applying this measurement tool, questions can be raised because environmental disclosure will differ across companies due to variation in writing style, page and type size (Brammer & Pavelin, 2006; Hackston & Milne, 1996). In addition, there is not a straightforward relation between the amount or the length of disclosure and the level of environmental disclosure. It is more interesting to examine measures of quality.

The purpose of this paper is to identify whether specific environmental actions are disclosed, whether the environmental impact of an organization is quantified and whether environmental targets are achieved (Brammer & Pavelin, 2006). Content analysis is the research method, which is used to identify whether the above issues are included in the environmental report (cf. Beck et al., 2010). Therefore, it is an improved tool to measure the level of environmental disclosure compared to counting the words or sentences. In other words, the scope, depth and length of environmental disclosure, is evaluated. This research is employing the content analysis scorecard, developed by Clarkson et al. (2008) in collaboration with an environmental disclosure expert. The authors state that the scorecard "is valuable to users who seek to assess the firms' true environmental commitment and related environmental exposures" (Clarkson, Li, Richardson, & Vasvari, 2008, p.305). Ribeiro, Van Bellen, and Carvalho (2011) claim that this scorecard based on Global Reporting Initiative (GRI) is comprehensive and very complete.

The present article is divided in six sections, including this introduction and the conclusion. The next section provides a review of existing literature and prior research about environmental disclosure practices. In section three, the existing theoretical knowledge will be discussed and hypotheses will be formulated.

The fourth section contains the research methodology, including a description of the sample selection, the measurement of the variables and the data collection. In the fifth section, the results of the study will be presented and, at the end, a conclusion will be drawn, and possible limitations and suggestions for future research will be addressed.

2 LITERATURE REVIEW

2.1 Definitions and Context.

The aim of this research is to test the influence of selected variables on the level of environmental disclosure by using the Clarkson et al. (2008) scorecard, which is highly valuable to assess the firm's true environmental commitment. This research's analyzed data is a sample of Dutch firms. In order to examine the relationships between potential determinants and environmental disclosure, the data is important to realize a clear definition of environmental disclosure. It can be defined as the provision of public and private information, financial and non-financial information, and quantitative and non-quantitative information regarding to the organization's management of environmental issues. This information is provided in the annual report or in any other form, mostly of the time a separate environmental report is issued (Gray et al., 1995). This separate environmental report is often referred to a CSR report. Helpful is the World Business Council for Sustainable Development in which is provided this definition of CSR reports (World Business Council for Sustainable Development [WBCSD], 2002, p.7):

> (…) public reports by companies to provide internal and external stakeholders with a picture of corporate position and activities on economic, environmental and social dimensions. In short, such reports attempt to describe the company's contribution toward sustainable development.

KPMG (2008) has performed an international survey of corporate social reporting on the 100 largest companies by revenue from a sample of 2200 firms in 22 countries. They concluded that, nowadays, environmental reporting is widely adopted by organizations, as the 80 percent of the world's largest companies issues stand-alone CSR reports: "The question is no longer 'Who is reporting?' but 'Who is not?' Corporate responsibility reporting is now a mainstream expectation of companies" (KPMG, 2008, p. 14).

A research shows that more and more organizations decide to report environmental information to their stakeholders. In the early 1990s, Roberts (1991) concluded that, despite the majority of the companies in France, Germany, the Netherlands, Sweden and Switzerland disclose environmental information, the level of this information is low. Nevertheless, a study performed by Kolk (2003) to the 250 largest Fortune 500 companies (this data represents companies from France, Germany, Italy, Japan, the Netherlands, South Korea, Switzerland, the UK and the US) during the years 1998 to 2001, concluded that sustainability reporting has increased considerably within those countries. The author also concluded that environmental reporting is applied more in the industrial sectors than in the financial sectors. The level of environmental disclosure is also depending on country specific legislation and the reporting culture of the country. The companies make more environmental disclosures in such regulated countries, especially in the USA, Canada and the UK either because environmental reporting is mandatory or because society or stakeholders demand reporting (Gray et al., 1995; Hackston & Milne, 1996). Besides the mandatory requirements to disclose environmental information, there are a variety of reasons why organizations decide to, voluntarily, disclose this information.

A list of motivations for managers to provide environmental information is mentioned by Deegan (2002): 1) to believe in an accountability or responsibility to report, 2) to desire to comply the borrowing requirements, 3) to comply the community expectations, as a result of certain threats to the organization's legitimacy, 4) to manage particular stakeholders, 5) to attract investment funds, 6) to comply the industry requirements, 7) to forestall efforts to introduce more onerous disclosure regulations, 8) to win particular reporting awards, among others.

In the accounting literature, an extensive research has been conducted in which the presence, quantity, quality and usefulness of environmental disclosure are examined (Belkaoui, 1976; Brammer & Pavelin, 2006; Campbell, Craven, & Shrives, 2003; Cho & Patten, 2007; Cormier & Magnan, 2003; Cowen et al., 1987; Deegan & Gordon, 1996; Gray et al., 1995; Hackston & Milne, 1996; Ingram, 1978; Kolk, 2003; Neu et al., 1998; Patten, 1992, 2002; Roberts, 1992; Shane & Spicer, 1983; Silva Monteiro & Aibar-Guzmán, 2010; Trotman & Bradley, 1981). The results have been mixed, however, researches investigating environmental disclosures practices and its quality performed in the 1980s and in the early 1990s concluded that the quality of environmental disclosure is poor and that there is a lack of consistent disclosure techniques (Gamble et al., 1996). Nevertheless, the quality of the environmental reporting seems to have increased during the 1990s. Cormier and Magnan (2003) state that firms in most of the European countries are expanding the quantity and the quality of their environmental disclosure.

2.2 Environmental Reporting in the Netherlands.

The country level variables explain the level of environmental disclosure (Roberts, 1991). In contrast to the understanding of environmental disclosure in Anglo-Saxon countries, the environmental disclosure determinants in continental Europe are rather unknown (Cormier & Magnan, 2003). This research is an attempt to extend the scope of knowledge about the country specific determinants of

environmental disclosure by examining the environmental disclosure determinants in the Netherlands.

Only little empirical researches have been conducted about environmental reporting in the Netherlands. The Dutch consultancy firm DHV (2001) examined reporting practices and questioned firms operating in the Netherlands. DHV states that corporate social responsibility is becoming more important in the Netherlands, because, in general, the number of firms reporting has been developing positively. On the other hand, they found out that, in the period from 1998 to 2000, there was an opposite or reluctant development in sustainability reporting. Firms stopped their reporting because of the costs and the non-stimulating, non-interested stakeholders. Akzo Nobel, for instance, stopped reporting because of its high costs and the stakeholders were not interested in such reports. Shell decreased their reporting practice in 2000 in comparison to 1999 for the same reasons.

The Dutch government builds on the self-regulating and disciplining functioning of businesses and, therefore, there are no mandatory legislations or rule-based standards (Ministry of Economic Affairs, 2008). In 2000, the government has requested recommendations to the Social-Economic Council (Sociaal-Economische Raad) about CSR and the role of the Dutch government, business community and Non-governmental organizations (NGOs). The recommendations were published in 'De winst van waarden' [the profit of values] (Sociaal-Economische Raad [SER], 2000). The Social-Economic Council advocates enhanced transparency of CSR by increasing economic, social and environmental reporting. To make it possible, a conceptual framework for medium and large organizations was prepared by the Dutch Accounting Standards Board (Raad voor de Jaarverslaggeving), upon the Dutch government instructions. This framework, based on the guidelines for sustainability reporting developed by the GRI, stimulates the CSR reports consistency, transparency and verifiability (Raad voor de Jaarverslaggeving, 2003).

2.3 Environmental Performance Determinants.

Examining environmental performance determinants has been a popular field of study (Christ & Burritt, 2013; Cormier & Magnan, 2003; Cowen et al., 1987; Deegan & Gordon, 1996; Erlandsson & Tillman, 2009; Hackston & Milne, 1996; Liu & Anbumozhi, 2009; Roberts, C.B., 1991; Roberts, R. W., 1992; Silva Monteiro & Aibar-Guzmán, 2010; Trotman & Bradley, 1981). These studies have examined the effect of several variables like: firm size, profitability, industry, country of firm ownership, country of reporting, leverage, capital intensity, company age, the existence of a CSR committee, stakeholder power and governmental influences (Hackston & Milne, 1996; Roberts, 1992). Three frequently studied determinants are corporate size, industry and corporate profitability. There is no existing empirical knowledge about the effect of these variables on environmental disclosure. Therefore, this study will also examine the relationship between these determinants and environmental disclosure in order to compare the results with the existing accounting literature. In the following part, the current state of knowledge on each determinant will be described.

2.3.1 Corporate size.

The majority of the empirical studies has found significant evidence that there is a positive relation between company size and the level of social and environmental disclosure (Brammer & Pavelin, 2006, 2008; Cormier & Magnan, 2003; Cowen et al., 1987; Gray et al., 1995; Hackston & Milne, 1996; Kolk, 2003; Patten, 1992, 2002; Silva Monteiro & Aibar-Guzmán, 2010; Trotman & Bradley, 1981; Zeng, Hu, Yin, & Tam, 2012). This positive relation assumption is based on the fact that, in general, larger companies participate in a higher number of businesses and are operating on an international scale. These activities have a greater impact on the natural environment and, consequently, on society. Also, larger companies have to satisfy a higher number of stakeholders who might be interested in environmental management and initiatives undertaken by the company. Therefore, these companies experience higher social and regulatory pressures to disclose environmental information than smaller firms (Brammer & Pavelin, 2006; Cowen et al., 1987; Deegan & Gordon, 1996; Hackston & Milne, 1996; Silva Monteiro & Aibar-Guzmán, 2010).

Furthermore, the environmental disclosure process is costly and the larger companies are more likely to be able, in contrast to medium and small sized companies, to spend resources to prepare and disclose environmental information (Silva Monteiro & Aibar-Guzmán, 2010). The last assumption, suggested by Wong and Fryxell (2004), underlies this positive relationship. The authors state that especially larger firms are becoming aware of the importance of building and maintaining a good corporate reputation and those firms try to disclose its environmental information to safeguard or expand this reputation. In addition, Brammer and Pavelin (2006) think also that larger companies are making significantly higher quality disclosures than smaller firms. However, other studies did not find a positive relationship between firm size and environmental disclosure (Roberts, 1992; Toms, 2002; Wagner, Phu, Azomahou, & Wehrmeyer, 2002).

2.3.2 Industry.

A generally accepted assumption is that a relationship between the industry in which a firm is operating and its environmental disclosures exists The general expectation is that companies in, so-called, high profile (or environmental sensitive) industries will disclose more environmental information than companies in low-profile industries (Brammer & Pavelin, 2006, 2008; Campbell et al., 2003; Cho & Patten, 2007; Deegan & Gordon, 1996; Hackston & Milne, 1996; Roberts, 1992; Zeng et al., 2012).

There are two underlying assumptions that support this expectation. First, companies operating in envi-

ronmental sensitive industries have to comply with strict environmental regulations due to the polluting characteristics of their activities (Silva Monteiro & Aibar-Guzmán, 2010). Therefore, firms operating in these sensitive industries should disclose their environmental concerns, otherwise stakeholders and especially investors will assume the worst (Cormier & Magnan, 2003; Clarkson et al., 2008; Cho & Patten, 2007; Hackston & Milne, 1996).

Second, environmental sensitive industries face greater societal pressure because they are more likely to be associated with visible environmental concerns, like the greenhouse gas emission and the risk of environmental disasters (Brammer & Pavelin, 2006; Silva Monteiro & Aibar-Guzmán, 2010). As a result, if environmental sensitive firms do not disclose sufficient environmental information, it can unleash disturbing reactions among environmental pressure groups and governments. Ultimately, society will turn against those companies. Therefore, companies that operate in environmentally sensitive industries tend to disclose more environmental information (Cho & Patten, 2007; Clarkson et al., 2008; Deegan & Gordon, 1996; Hackston & Milne, 1996).

Several studies actually find a relationship between industry and environmental disclosure, although the industries classification differs among them. Hackston and Milne (1996), Patten (1991) and Roberts (1992) reached a consensus that high-profile industry companies disclose significantly more environmental information than companies from low-profile industries. High-profile industries are for example the oil, chemical, metal, utility, airline, paper and water sectors (Cho & Patten, 2007; Clarkson et al., 2008; Hackston & Milne, 1996; Patten, 1991; Roberts, 1992).

Kolk (2003) concluded that environmental reporting is much more common in industrial sectors, compared to the financial sector. Silva Monteiro and Aibar-Guzmán (2010) state that industry membership is positively and significant correlated with environmental disclosure, in the Portuguese context. Furthermore, Brammer and Pavelin (2006) postulate that firms in the chemicals, resource extraction and utilities sectors provide significantly higher quality of environmental disclosure and firms in the high technology and finance sectors disclose a significantly lower quality of environmental information.

2.3.3 Profitability.

The third variable that will be tested in this study is the relationship between environmental disclosure and corporate profitability. It can be expected that there is a positive relationship between profitability and environmental disclosure. This expectation is based on the thought, best described by Brammer and Pavelin (2006, p.1174), that: "profits provide managers with a pool of resources from which the costs of making environmental disclosures are funded." Furthermore, if management is disclosing their environmental activities and performance, it is demonstrating to its stakeholder that the company can meet and respond to social demands. In other words, management is undertaking long-term strategic planning which is needed to survive (Cowen et al., 1987).

However, studies that have determined the relationship between profitability and environmental disclosure provided mixed results. Whereas some of the studies conclude that there is a positive relationship between profitability and environmental disclosure (Al-Tuwaijri, Christensen, & Hughes, 2004; Clarkson et al., 2011; Ingram, 1978; Neu et al., 1998), other studies have failed to find a significant relationship between these two variables (Brammer & Pavelin, 2006, 2008; Cowen et al., 1987; Freedman & Jaggi, 1982; Hackston & Milne, 1996; Patten, 1991; Silva Monteiro & Aibar-Guzmán, 2010; Zheng et al., 2012). Furthermore, some studies find a positive, but temporary, relationship between profitability and environmental disclosure (Belkaoui, 1976; Shane & Spicer, 1983), and Roberts (1992) has found evidence of a positive relationship between lagged profits and environmental disclosure. This is in line with Ullmann's argument (1985), in which is said that profit should be necessary before a company devotes its resources to meet stakeholder demands.

3 THEORY AND HYPOTHESES

The objective of this research is to test the influence of selected variables on the level of environmental disclosure. For this study, three variables that have been used to explain the environmental disclosure are selected. The variables are corporate size, industry and profitability. For each variable, a hypothesis based on the existing knowledge and theory will be formulated. Therefore, firstly, it will be given an overview of the environmental disclosure theory.

3.1 Theoretical Framework.

In former research, it is approached different theories, which can explain the effect of the specific variables on the provided environmental disclosure. Obviously, the theoretical underpinnings differ (Silva Monteiro & Aibar-Guzmán, 2010). The theories included in the majority of the studies in CSR reporting are the legitimacy theory (Aerts & Cormier, 2009; Brown & Deegan, 1998; Campbell et al., 2003; Cho & Patten, 2007; Deegan, 2002; Deegan, Rankin, & Tobin, 2002; Deegan & Gordon, 1996; Neu et al., 1998; O'Donovan, 2002; Patten, 1992, 2002), the stakeholder theory (Deegan & Blomquist, 2006; Roberts, 1992) and the voluntary disclosure theory (Brammer & Pavelin, 2006; Clarkson et al., 2008; Verrecchia, 1983).

3.1.1 Legitimacy theory.

The legitimacy theory is probably the most widely

used to explain environmental disclosure. According to Cho and Patten (2007), the legitimacy theory implies that environmental disclosure is a function of the intensity of societal and political pressure faced by a company regarding the environmental performance. As a reaction on this pressure, firms try to provide more environmental information.

Organizations strive for a balance between organizational values and societal values. When it is achieved, there is a, so-called, social contract between the organization and the society. If the society observes that the organization fails to operate as the social contract, the societal values are not in accordance with the organizational values, so there will be a negative societal opinion about this organization (Milne & Patten, 2002). Such a negative opinion might be a threat to the organization's going concern. When the organization is operating in such a manner that does not satisfy the society, it will break the organization's social contract. The societal reaction will be, for example, reduced demand by consumers for the products or services from the organization, and suppliers will limit the supply of resources to the firm (Deegan, 2002). A broken social contract is referred to as a legitimacy gap. In response to this gap, organizations will do the best they can to repair or compensate the broken contract (Deegan, 2002). For example, companies try to repair the contract by providing positive environmental disclosure (Milne & Patten, 2002; Patten, 1992).

3.1.2 Stakeholder theory.

The stakeholder theory is highly interrelated with the legitimacy theory. Whereas the legitimacy theory focuses on communication with society, the stakeholder theory focuses on the communication with different stakeholder groups. According to the stakeholder theory, society consists of various stakeholder groups. Those groups have unequal power to influence the activities of an organization, but all groups are concerned with the environmental performance of the company (Roberts, 1992). The going concern of an organization requires the stakeholders' support and therefore the corporate activities should be adjusted to the stakeholders' demands. The more power stakeholders have, the more a company must adjust its activities to stakeholders' demands (Gray et al., 1995), because stakeholders have the ability to control resources that are critical for the activities of an organization (Ullmann, 1985). Roberts (1992) observes that disclosure is part of the dialogue between the company and its stakeholders for negotiating the social contracts.

Legitimacy and stakeholder theory are closely related and should not be considered competing but in a broader sense as complementing each other (Deegan, 2002; O'Donovan, 2002). Motivations for stakeholder's involvement is an item that have been studied by Berman, Wicks, Kotha, and Jones (1999), they have argued that the intrinsic stakeholder's commitment – to do what is the right thing to these stakeholders – plays no significant role. The main reason why companies engage in stakeholder's involvement relates to the bottom-line number, that is, profitability.

3.1.3 Voluntary disclosure theory.

The legitimacy theory and stakeholder theory might be useful in explaining 'what' an organization disclosed, but it might not be useful in explaining 'how much' is disclosed (Clarkson et al., 2008). Therefore, a supplementary theory is used in the literature, which can explain the level of disclosure practices. Voluntary disclosure theory is based on the agency theory perspective. According to Brammer and Pavelin (2006, p.1171): "Voluntary disclosures are attempts to remove informational asymmetries between the firm and external agents, primarily agents in the investment community." The voluntary disclosure theory predicts that organizations, which have a good environmental performance, do not hide the environmental impact of their operations and are willingly to inform stakeholders about their environmental activities. Voluntary disclosure predicts that the information risk for current and potential investors will be lowered (Brammer & Pavelin, 2006).

First, voluntary disclosure can lead to a competitive advantage because it highlights the environmental programs and the impact of activities on the natural environment. Second, stakeholders receive bad news from the company along with good news. Investments in environmental management or programs are costly and, for the short term, they will not result in higher returns. If disclosure is absent or low, stakeholders will assume that the current environmental strategy adopted by the firm is inferior (Clarkson et al., 2008; Verrecchia, 1983). Superior environmental performers truly disclose issues regarding environmental affairs, the quality of their disclosures is superior to the quality of the weak environmental performers. The superior firms believe that their strengths will outweigh the weaknesses and do not fear the reaction of any stakeholder (Clarkson et al., 2008).

3.2 Hypotheses Development.

3.2.1 Impact of size.

The majority of the empirical studies has found significant evidence that there is a positive relationship between company size and the level of social and environmental disclosure (Brammer & Pavelin, 2006; Cowen et al., 1987; Gray et al., 1995; Hackston & Milne, 1996; Patten, 1992; Zeng et al., 2012). Therefore, a positive relationship is predicted between firm size and the level of environmental disclosure. This is also consistent with the stakeholder theory, which claims that stakeholders have the opportunity to control the resources of a com-

pany. Larger organizations have more stakeholders and therefore they are more likely to satisfy their stakeholders, in order to keep they operating.

Hypothesis 1 – There is a positive relationship between the size of a company and the level of environmental disclosure.

3.2.2 Impact of industry.

A positive association between the business nature of the organization and the environmental disclosure can be expected (Brammer & Pavelin 2006, 2008; Campbell et al., 2003; Cho & Patten, 2007; Deegan & Gordon, 1996; Hackston & Milne, 1996; Roberts, 1992; Zeng et al. 2012). It is consistent with the legitimacy and stakeholder theory which state that some industries are considered to feel greater pressure from society or certain stakeholders, to provide environmental information and thus they are more likely to disclose this information to avoid a legitimacy gap between the society and the corporate operations (Deegan, 2002). Therefore, it is expected that firms that operate in a high profile industry reach a higher level of environmental disclosure than firms that operate in a low-profile industry.

Hypothesis 2 – There is a higher level of environmental disclosure provided by firms operating in a high-profile industry than by firms operating in a low-profile industry.

3.2.3 Impact of profitability.

Given the inconsistent results for the relation between economic performance and environmental disclosure as described in the literature review, a null hypothesis is formulated to test the association between profitability and environmental disclosure.

Hypothesis 3 – There is no relationship between the economic performance of a company and the level of environmental disclosure.

The notion of profitability seems consistently with voluntary disclosure theory, as the means to convey information to outside investors is perceived as a vehicle to gain a competitive advantage. The idea underlying this theory is that companies can use voluntary environmental disclosure to signal that they have intangible assets (such as legitimacy or superior environmental performance advantages), which will help them to secure future profits. A rejection of this hypothesis will assume that economic performance or profitability is associated with environmental disclosure and the sign of correlation will point out whether it is a positive or negative relationship (Freedman & Jaggi, 1988).

4 RESEARCH DESIGN

4.1 Sample.

In order to perform the research, the largest 30 companies listed on the Amsterdam Euronext Index, on December 31st, 2008, were selected. This size ranking is based on the market capitalization of the companies (see Table 1). Hackston and Milne (1996) used a similar method to select the sample for their research. The 30 largest companies represent 94% of the total market capitalization on this date. From the initial sample, two companies are excluded. Those companies are holding companies of firms that are already in the sample. Heineken Holding is de holding of (7) Heineken. Hal Trust is an investment company that holds substantive investments in, among others, (23) Vopak and (25) BoskalisWestminster (Hal Investments, 2011). The final sample consists of 28 companies listed on the Amsterdam Exchange Index (AEX) and the Amsterdam Midcap Index (AMX), which represents 90% of the total market capitalization in the Dutch stock exchange. The CSR reports were collected from those 28 companies (if available).

Table 1 shows an overview of the sample, its industry and its reporting type. The initial intention was to rate the environmental disclosure provided in the annual reports, because it has been used in former studies as a basis of measuring environmental disclosure (Al-Tuwaijri et al., 2004; Cowen et al., 1987; Deegan & Gordon, 1996; Gray et al., 1995; Hackston & Milne, 1996; Hughes, Anderson, & Golden, 2001; Neu et al., 1998; Patten, 2002; Wiseman, 1982). Furthermore, Neu, Warsame, and Pedwell (1998) observed that annual reports are the primary source for stakeholders, regarding financial and non-financial information. However, in this research, CSR reports[1] are used as a source for environmental disclosure measurement. In most annual reports, there is a chapter for CSR, but, for the majority of the sample, this CSR-chapter consists of a brief summary of the company's CSR report, and for additional information they refer to their CSR report. Other companies, like Akzo Nobel and Philips, have merged their CSR report in their annual report. For the fairness of environmental disclosure measurement, it has been made the decision to measure the environmental disclosure as provided in the company's CSR report.

There was no CSR reports found on the corporate website of five companies. Email correspondence confirmed that they did not publish a separate CSR report. For those five companies, the annual report was used, in which they disclosed information about health, safety and environmental (HSE) issues. The CSR reporting year is 2008. For financial data the Bureau van Dijk database 'Amadeus' (Analyze major databases from European sources) was used. Missing financial data was calculated manually.

[1] CSR report means the social responsibility report that a firm has issued. The name that is given to the CSR report differs across company. 'Sustainability Report', 'duurzaamheidsverslag' (sustainability report), 'Triple P report' and 'Corporate Social Responsibility Report' are the most common names for CSR reports.

Table 1 *Sample overview*

Market Capitalization Rank	Company name	ICB-Sector	Reporting Type 2008
	High-profile industries		
1	ROYAL DUTCH SHELL	0001 OIL & GAS	CSR 2008
3	ARCELORMITTAL	1000 BASIC MATERIALS	CSR 2008
10	AKZO NOBEL	1000 BASIC MATERIALS	CSR 2008
17	DSM KON	1000 BASIC MATERIALS	CSR 2008
19	AIR FRANCE -KLM	5000 CONSUMER SERVICES	CSR 2008-2009
26	SBM OFFSHORE	0001 OIL & GAS	CSR 2008
	Low-profile industries		
2	UNILEVER	3000 CONSUMER GOODS	CSR 2008
4	KONINKLIJKE KPN	6000 TELECOMMUNICATIONS	CSR 2008
5	ING GROEP	8000 FINANCIALS	CSR 2008
6	KON PHILIPS ELECTR	3000 CONSUMER GOODS	CSR 2008
7	HEINEKEN	3000 CONSUMER GOODS	CSR 2008
8	AHOLD KON	5000 CONSUMER SERVICES	CSR 2008
9	UNIBAIL-RODAMCO	8000 FINANCIALS	CSR 2008
11	AEGON	8000 FINANCIALS	CSR 2008
12	REED ELSEVIER	5000 CONSUMER SERVICES	CSR 2008
13	ASML HOLDING	9000 TECHNOLOGY	CSR 2008
14	HEINEKEN HOLDING		
15	TNT	2000 INDUSTRIALS	CSR 2008
16	WOLTERS KLUWER	5000 CONSUMER SERVICES	CSR 2008
18	HAL TRUST		
20	RANDSTAD	2000 INDUSTRIALS	Annual Report 2008
21	CORIO	8000 FINANCIALS	Annual Report 2008
22	FORTIS	8000 FINANCIALS	CSR 2008
23	VOPAK	2000 INDUSTRIALS	CSR 2008
24	FUGRO	0001 OIL & GAS	Annual Report 2008
25	BOSKALIS WESTMIN	2000 INDUSTRIALS	Annual Report 2008
27	WERELDHAVE	8000 FINANCIALS	Annual Report 2008
28	LOGICA	9000 TECHNOLOGY	CSR 2008
29	SNS REAAL	8000 FINANCIALS	CSR 2008
30	VAN LANSCHOT N.V.	8000 FINANCIALS	CSR 2008

4.2 Measurement of Variables.

4.2.1 Dependent variable.

The dependent variable in this study is the level of the environmental disclosure, or CSR disclosure, as it is used in its complete form. The most widely used technique to measure CSR disclosure is content analysis (Al-Tuwaijri et al., 2004; Clarkson et al., 2008; Cowen et al., 1987; Deegan & Gordon, 1996; Gray et al., 1995; Hackston & Milne, 1996; Hughes et al., 2001; Neu et al., 1998; Wiseman, 1982). Content analysis is a technique whereby text is codified into groups or categories according to specific criteria (Milne & Adler, 1999). A definition to content analysis is provided by Krippendorff (1980, p. 21): "a research technique for making replicable and valid inferences from data according to their context."

In prior research, environmental disclosure measurement techniques can be categorized into two groups: the ones who count disclosures, and the ones who classify them (Milne & Adler, 1999). The first group uses measures that quantify the level of environmental disclosure. For example, number of pages, sentences and words, number of news types (bad, good, or neutral news) or number of disclosure items (Deegan & Gordon, 1996; Gray et al., 1995; Guthrie & Parker, 1989; Hackston & Milne, 1996; Milne & Adler, 1999; Neu et al., 1998; Patten, 2002). The main criticism on this type of measurement is that it cannot take into account the use of non-textual information (McMurtrie, 2005). Neither is it possible to assess the quality of the disclosed information.

The second technique is a scoring measure where the text is classified. By using this measurement tool, researchers quantify the provided environmental information by identifying specific environmental items, and then they analyze the disclosure on each item using a yes/no (1, 0) scoring. In the end, a score per firm can be calculated (Al-Tuwaijri et al., 2004; Clarkson et al., 2008; Freedman & Jaggi 1982, 1988; Wiseman, 1982). Wiseman (1982) is one of the first who developed such a specific scorecard for environmental disclosure evaluation. She developed it to measure the existence of

disclosure on 18 items. These items were classified into four categories: 1) economic factors; 2) environmental litigation; 3) pollution abatement items; and 4) other environmentally related information. The total score of each firm was calculated.

Al-Tuwaijri, Christensen, and Hughes (2004) and Freedman and Jaggi (1982, 1988) developed a simplified scorecard. Al-Tuwaijri et al. (2004) used a content analysis methodology focused on the pollution-related information in the environmental report. Four different pollution items are assessed: 1) designation for cleanup responsibility of toxic; 2) toxic waste generated and recycled; 3) oil and chemical spills; and 4) environmental fines and penalties. Freedman and Jaggi (1982) developed a pollution disclosure index, which assigns weights to different aspects of the environmental disclosure provided in the annual report. The index contained items, like emissions data, past/current/future capital expenditures on environmental initiatives and descriptive information regarding environmental initiatives.

For this study, the environmental disclosure index, used in Clarkson et al. (2008), will be adopted (see Appendix A). The Clarkson et al. (2008) content analysis index is suitable for environmental reports, but also for corporate websites. The scorecard was developed in cooperation with an expert in the field of environmental reporting and it is based on sustainability reporting guidelines, issued in 2002, by the Global Reporting Initiative (GRI). The GRI is a joint initiative of the Coalition for Environmentally Responsible Economies, a US NGO, and the UN Environmental Program. The overall goal is to develop a universally accepted framework to enhance the quality, rigor, and utility of sustainability reporting (Global Reporting Initiative [GRI], 2009).

The index contains items that are divided into 'hard' and 'soft' disclosure items. The 29 'hard' disclosure measures (divided in 4 categories) are objective measures. Environmental claims can easily be verified and cannot easily be mimicked by poor environmental performers. The 16 'soft' disclosure measures (divided in 3 categories) are subjective, because they are unverifiable claims to be committed to the environment and they can be easily mimicked. The scorecard consists of seven categories. The categories 1 to 4 represent 'hard' and the categories 5 to 7 represent 'soft' environmental disclosure items. Each category represents a specific topic, regarding possible disclosures: 1) 'governance structure and management systems', which can be in place with respect to environmental protection; 2) 'credibility' of the provided disclosures in the report; 3) 'environmental performance indicators (EPI)' are assessed.

EPI data can be disclosed by firms to convince stakeholders about their environmental commitments. Extra scores are awarded when firms disclose EPI with respect to historical trends, emission targets and the industry average; 4) 'environmental spending'; 5) 'disclosure of vision and environmental strategy'; 6) 'environmental profile' of a firm given the current and forthcoming environmental regulations; 7) 'environmental initiatives' in which a firm is participating (Clarkson et al., 2008).

The main problem with content analysis is dealing with reliability and the ability to replicate the study (Milne & Adler, 1999). Therefore, to deal with these issues, two other coders were asked to rate a sample of the CSR reports. Disagreements were discussed and some items were adjusted to the agreed score. In general, the opinions of each coder were in line with each other.

4.2.2 Independent variables.

Size

The size of a company can be measured in several ways. The most commonly used measures are number of employees, total assets, sales volume, or an index rank (Fortune 500). In this study, three indicators will be used as measures of size: market capitalization (as on December 31st, 2008), sales, and total assets (Clarkson et al., 2008; Hackston & Milne, 1996; Trotman & Bradley, 1981). Using multiple measures of size will contribute to the robustness of the findings.

Industry type

The classification of industries into environmental sensitive and non-sensitive industries is a subjective method. For every industry, it is possible to ground it into an environmental sensitive industry. In this research, the classification criteria outlined in Roberts (1992) will be used. Roberts defines high-profile industries (environmental sensitive industries) as those with high consumer visibility, high level of political risk, and concentrated intense competition. For the industries, included in this research sample, the oil and gas and basic materials (steel and chemicals) are classified as high-profile. These industries seem to be the ones that meet Roberts' definition of high-profile industries. Consumer services and goods, industrials, financials and communications are classified as low profile industries (Table 1).

However, there are two exceptions in the classification of companies into high- and low-profile industries. The company Fugro is classified into the oil and gas industry, according to the Industry Classification Benchmark Sector (ICB-Sector). In this research, Fugro will be classified as a low profile, because Fugro is a company that "collects, processes and interprets data related to the earth's surface and the soils and rock beneath" (Fugro, 2010). Fugro is only indirectly involved with drilling of oil and gas or mining. Fugro performs exploration activities by analyzing data and gives advice to oil, gas and mining corporations.

The other exception is regarding the inclusion of the airline service industry into the high-profile industry. Airlines are classified among consumer services industry, which is a low-profile industry. The airline in this research 'Air France-KLM' will be classified as a high-profile industry. There is a high level of societal and political

pressure regarding flying. Flying is perceived as high-polluting (Wong & Fryxell, 2004). As a reaction, airlines give customers the option to compensate their emission. Also the governments are trying to make flying less attractive by extra taxation when using airplanes.

Profitability

Profitability can be measured by multiple indicators. In prior studies, single year accounting measures are used (Freedman & Jaggi, 1982) and multiple year averages are used (Cowen et al., 1987; Hackston & Milne, 1996). A more reliable measure of profitability is measuring profitability over an extended period (Hackston & Milne, 1996). Therefore, in this study the five-year average return on equity (EBIT/total equity) and the five-year average return on assets (EBIT/total assets) is used as a measure for profitability. Once more, multiple measures of size will contribute to the robustness of the findings.

5 RESULTS

For this research, 28 companies have been rated on the level of their environmental disclosure in the year 2008. Five of those companies did not publish a separate CSR report. The data of those companies are collected from their annual reports of 2008. All data used is derived from CSR reports and annual reports; no data is used from the corporate websites or other media channels. After rating the CSR reports, the annual reports were also rated. It was done because some data were not available in the CSR reports while they were in the firms' annual reports. For example, information about whether executive compensation was linked to environmental performance measures. In the CSR report, no information was given on this topic, but in the remuneration report, which is part of the annual report, the information about global chief executive officer's (CEO) targets was available. Also disclosure about management positions for environmental management was not always included in the CSR report, but it was available in the annual report.

In Table 2, the descriptive statistics are presented for the overall sample (for a score per firm, see Appendix B). A distinction is made among: 1) the high- and low-profile industries; 2) CSR reports without GRI-guidelines and with GRI-guidelines; and 3) environmental reporting as part of the annual report or separate CSR reporting.

Table 2 *Descriptive statistics*

Present: means (medians) and ranges (min-max).	Overall n=28		High-profile Industries n=6		Low-profile Industries n=22		no GRI Adoption n=8		GRI Adoption n=20		AR Report n=5		CSR Report n=23	
Hard disclosure (0-79)	18.29	(19)	24	(25.50)	16.73	(17.50)	11.50	(9.50)	21.00	(21)	6.00	(4)	20.96	(21)
	3-32		13-32		3-28		3-23		10-32		3-10		9-32	
Soft disclosure (0-16)	5.25	(6)	6.50	(6.50)	4.91	(5)	4.13	(4.50)	5.70	(6)	3.40	(3)	5.65	(6)
	1-9		6-7		1-9		1-6		2-9		2-5		1-9	
Total (0-95)	28.50	(29.5)	37	(39.50)	26.18	(28.50)	19.13	(15.50)	32.25	(33)	12.80	(11)	31.91	(33)
	9-46		25-46		9-44		9-34		14-46		9-20		11-46	

As can be seen, the mean values among the three groups are higher for the groups also expected. The high-profile industries, the GRI-adoption group and the CSR report group show a higher mean than their opposites. The higher mean score for the high-profile industries is also assumed in the second hypothesis, because high-profile industries are more likely to face societal perceptions about their environmental damaging activities, and so they are more likely to provide a detailed report to comply with stakeholder demands (Adams, 2004). Testing of this hypothesis will be discussed later.

Twenty companies have adopted the GRI guidelines for sustainability reporting. Therefore, those companies have structured their report in almost the same way. The companies that did not adopt the GRI guidelines have a mean score of 19.13, and the companies that have adopted the GRI guidelines have a mean score of 32.25. This difference in means could be possible because the scorecard that is based on the GRI guidelines. Therefore, it is more likely that the companies that have applied the GRI guidelines will score higher. In absolute numbers, the difference between AR reporting and CSR reporting is larger. It happens because in the annual reports environmental issues it has just a little brief discussion, which makes it very hard to score any points.

In a depth analysis for the total disclosure score, examining the hard disclosure items and the soft disclosure items, the results are equals. The groups, for which a higher score is 'expected', report a higher mean on both, hard and soft disclosure. As can be seen, the absolute differences between high- and low-profile industries, no GRI- and GRI-adoption and AR- and CSR-reporting are larger for the hard disclosure items than for the soft disclosure items.

The main reason for this is that more points can be scored on hard disclosure items, but it is also because of the limited score for some companies on their environmental performance indicators (EPI) items. The section for hard disclosure items is divided into four items of hard, difficult to mimic, disclosure categories. 60 out of 79 points (76%) can be scored if a company

discloses all its EPIs. There are 10 EPI's and a maximum of 6 can be given to every EPI. The maximum score that is awarded in this category is 19 (30%). It means that 41 points on a total of 79 hard disclosure items are not awarded during this content analysis. This will result in relatively low numbers of addressing the hard disclosure items. On average, 23% of the hard disclosure items are scored (18.29 out of 79) with a maximum of 40% (32 out of 79). Furthermore, it is remarkable that on certain aspects of the scorecard no points are scored, especially in the soft, easy to mimic, disclosure items environmental profile and environmental initiatives. None of the companies provide an overview of the environmental impact on the industry in which they are operating. Also, no information about their environmental performance relative to their industry peers is given by any of the firms in the sample.

In the environmental spending item (hard disclosure item), only 1 (out of 28) company has disclosed information about their savings arising from environmental initiatives. Information about the amount spent on environmental technologies is also absent for 26 companies.

Table 3 *Descriptive statistics independent variables (N=28)*

	Mean	Std. Deviation	Min	Max	Skewness	Kurtosis	Shapiro-Wilk	
							W-stat	Sig.
Independent variables								
Market capitalization 2008	15.352	1.146	13.798	18.050	0.487	-0.534	0.952	0.228
Total assets 2008	16.722	1.637	14.568	21.010	0.815	0.267	0.934	0.079
Sales 2008	15.496	1.822	11.736	19.578	-0.114	-0.112	0.986	0.964
ROE 2008	-0.005	1.266	-6.274	1.157	-4.788	24.536	0.397	0.000
ROE average	0.230	0.184	-0.335	0.544	-0.571	2.026	0.915	0.025
ROA 2008	0.058	0.074	-0.100	0.211	0.283	-0.120	0.965	0.463
ROA average	0.078	0.056	-0.013	0.222	0.496	0.254	0.963	0.406
Dependent variables								
Hard disclosure	18.29	8.142	3	32	-0.278	-0.504	0.966	0.490
Soft disclosure	5.25	1.898	1	9	-0.142	0.069	0.954	0.255
Total disclosure	28.50	10.983	9	46	-0.354	-0.787	0.943	0.128

Table 3 provides the descriptive statistics for the independent measures of size and profitability and the dependent variables. The size measures are adjusted to the natural logarithm due to their non-normality. The negative figures in return on assets (ROA) and return on equity (ROE) minimums are possible because of the negative financial performance figures. Negative figures of the ROE of 2008 measure can be explained due to the worldwide financial crisis.

A Shapiro-Wilk test is performed to test normality. This test is used due to the small sample size. The ROE 2008 and the average ROE numbers are not normally distributed. It happens, as mentioned before, because of the disturbed 2008 financial figures due to the financial crisis. The other variables are normally distributed.

In the total, three hypotheses are tested in order to examine the relationship between an independent variable and the level of environmental disclosure.

The first hypothesis tested is the following:

Hypothesis 1 – There is a positive relationship between the size of a company and the level of environmental disclosure.

The effects of three size indicators were tested on the dependent variable total disclosure. As can be seen in Table 3, both, the dependent variable and the independent variables, turned out to be normally distributed, which means that a Pearson correlation can be used to test the relationship between these variables. However, also the Spearman correlations are given.

Table 4 presents the results of the pair-wised Pearson and Spearman rank correlation tests and their significance.

Table 4 *Pearson and Spearman correlation test. Total disclosure and size*

Total disclosure and size		Total_ disclosure	LN_Market_ Capitalization_2008	LN_Total_ Assets _2008	LN_Sales_ 2008
Total_ Disclosure	Pearson Correlation	1	.534**	.375*	.610**
	Sig. (2-tailed)		.003	.049	.001
LN_Market_ Capitalization_ 2008	Spearman/Pearson Correlation	.532**	1	.537**	.560**
	Sig. (2-tailed)	.004		.003	.002
LN_Total_Assets _2008	Spearman/Pearson Correlation	.375*	.556**	1	.449*
	Sig. (2-tailed)	.049	.002		.016
LN_Sales_ 2008	Spearman Correlation	.603**	.598**	.508**	1
	Sig. (2-tailed)	.001	.001	.006	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Every correlation is positive. It implies that larger companies disclose on average a higher level of environmental information than smaller companies do. All the size measures are significantly correlated with environmental disclosure. When applying Pearson's correlation test, market capitalization has a correlation of 0.534 and it is statistically significant at the 1% level. Sales are also statistically significant at 1% and have a correlation of 0.610. Both correlation coefficients indicate a strong relationship with environmental disclosure. There is a medium relationship of 0.375 between total assets and environmental disclosure. This relationship is also confirmed, because the finding is statistically significant at the 5% level (0.049 < 0.050).

The same findings are supported when applying Spearman's rank correlation test. All the size measures are statistically significant correlated with environmental disclosure. Market capitalization has a correlation coefficient of 0.532 at 1% level and sales have a correlation of 0.603 at the same significance level. There is a medium correlation between environmental disclosure and total assets of 0.375 and this relationship is significant (0.049 < 0.05). All three measures of the size variable are significantly mutually correlated. It was expected because the three variables (market capitalization, total assets and total sales) should reflect the size of a company. Overall, the hypothesis one is confirmed. The findings suggest that the larger listed Dutch firms disclose more environmental information than the smaller firms. This is also consistent with the results from other studies (Hackston & Milne, 1996; Patten, 1991; Roberts, 1992; Silva Monteiro & Aibar-Guzmán, 2010).

The second hypothesis tested is:

Hypothesis 2 – There is a higher level of environmental disclosure provided by firms operating in a high-profile industry than by firms operating in a low-profile industry.

In order to test the relationship between the industry, a firm in operating and the level of environmental disclosure, a t-test for independent samples is performed. Concerning the firms' industry, a distinction between low profile (0) and high profile (1) industries is made. Table 5 shows the group statistics of the test and in Table 6 the results of the t-test are presented.

Table 5 *Group statistics*

Group statistics		N	Mean	Std. Deviation	Std. Error Mean
Total disclosure	0	22	26.18	10.496	2.238
	1	6[2]	37.00	8.854	3.615

Table 6 *T-test for independent samples for industry*

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Total disclosure	Equal variances assumed	.326	.573	-2.303	26	.030	-10.818	4.698
	Equal variances not assumed			-2.545	9.243	.031	-10.818	4.251

Equal variances are not assumed since the significance is 0.573 > 0.05. There is an absolute mean difference of the total disclosure level of 10.818 between low profile and high profile industries (the mean of high profile industries is 10.818 higher than the mean of low profile industries). Consequently, this mean difference is statistically significant (0.031 < 0.05). Therefore, the relation between environmental sensitive industries and the level of environmental disclosure can be confirmed. This is consistent with findings from comparable studies (Hackston & Milne, 1996; Patten, 1991; Roberts, 1992).

The last hypothesis tested is:

Hypothesis 3 – There is no relationship between the economic performance of a company and the level of environmental disclosure.

In order to examine the impact of the economic performance of a firm on its level of environmental disclosure, four measures of this economic performance are tested. These measures are: 1) ROE of 2008; 2) 2004-2008 average ROE; 3) ROA of 2008; and 4) 2004-2008 average ROA. Both Pearson and Spearman correlations are given, because ROE of 2008 is not normally distributed.

In Table 7, the results of the Pearson correlation and Spearman's rank test are presented.

[2] If Fugro is included in the high-profile sample, the hypothesis would not be confirmed. The means are 26.90 for the low-profile and 33.29 for the high-profile industry and the significance would be 0.260.

Table 7 *Pearson and Spearman correlation test. Total disclosure and profitability*

Total disclosure and profitability		Total_ disclosure	ROE_ 2008	ROE_ average	ROA_ 2008	ROA_ average
Total_ Disclosure	Pearson Correlation	1	.030	.101	.008	.121
	Sig. (2-tailed)		.880	.607	.968	.539
ROE_ 2008	Spearman/Pearson Correlation	.018	1	.747**	.566**	.457*
	Sig. (2-tailed)	.929		.000	.002	.015
ROE_ average	Spearman/Pearson Correlation	.063	.816**	1	.801**	.784**
	Sig. (2-tailed)	.749	0.000		.000	.000
ROA_ 2008	Spearman/Pearson Correlation	-.028	.913**	.715**	1	.830**
	Sig. (2-tailed)	.887	0.000	0.000		.000
ROA_ average	Spearman Correlation	.050	.822**	.857**	.762**	1
	Sig. (2-tailed)	.801	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The variables that reflect the profitability of the company (ROE of 2008, average ROE, ROA of 2008 and average ROA) are mutual highly correlated. None of the profitability measures provide statistically significant evidence to explain the relation between the corporate profitability and the level of environmental disclosure. According to the Pearson test, the correlation is weak till medium (range between 0.008 - 0.101). The results of the Spearman rank test provide only a very weak relationship (range between -0.028 - 0.063). Therefore, the third hypothesis is supported. The level of environmental disclosure seems to be unrelated to the profitability of the 28 largest Dutch companies. This is consistent with other research, which also failed to support a relation between corporate profitability and environmental disclosure (Cowen et al., 1987; Hackston & Milne, 1996; Patten, 1991; Roberts, 1992).

Summarizing, the size measures (market capitalization, total assets and sales) provide a statistically significant explanation about the dependent variable, environmental disclosure. An organization operating in an environmental sensitive industry is also positively associated with the level of environmental reporting. The remaining variable, profitability, does not have explanatory power over environmental disclosure.

6 CONCLUSION

The aim of this research was to perform an empirical study on the determinants of voluntary environmental disclosure in the Netherlands. The study makes two contributions to the extant literature. Firstly, by the way, it measures environmental disclosure. It is used a content analysis scorecard, applied in Clarkson et al. (2008), to investigate the level of environmental disclosure. The scorecard was developed in collaboration with an environmental disclosure expert. This current study is the first one that uses this kind of CSR quality measure. Former studies have used more quantitative measures of CSR disclosure, like number of words or sentences. The scorecard used in this research "is valuable to users who seek to assess the firms' true environmental commitment and related environmental exposures" (Clarkson et al., 2008, p. 305).

Secondly, the focus of the paper is the determinants of environmental reporting in the Netherlands. There is limited knowledge about Dutch disclosure practices and it is an interesting research area because the Dutch government does not enforce mandatory reporting laws, but builds on the self-regulating and disciplining functioning of businesses. They stimulate the disclosure of environmental information by providing a framework, which gives guidance for the consistency, transparency and verifiability of CSR reports. In this respect, it can be concluded that, due to the self-regulating and functioning of businesses, firms have to make decisions about the level to which environmental disclosure is provided. This research is an attempt to fill a gap and seek to uncover the variables that influence corporate motivation for CSR reporting.

Prior literature has defined certain variables to impact on the disclosure's quality, the most recurring ones are corporate size, industry type and profitability. However, these determinants are disputed, as there are many studies that have noticed that these determinants are not statistically significantly related to the level of environmental disclosure. CSR reports regarding 2008 are used

to measure the environmental disclosure per firm. The results confirm that two of these variables have a significant impact on the level of environmental reporting in the Netherlands. Firm size is a determinant of environmental disclosure, supported by hypothesis one. In this study, three indicators of size are used: market capitalization, sales and total assets (as on December 31st, 2008). All the size measures are significantly correlated with the environmental disclosure. The notion that larger firms leave a larger footprint and have more stakeholders than smaller ones is consistent with stakeholder theory.

The variable industry is also having a significant impact on environmental disclosure. Firms are classified into high- and low-profile industries, meaning that high-profile ones are environmental sensitive industries. In this research, the oil and gas, basic materials (steel and chemicals) and the airline industry are classified in the high-profile group. The results show that there is a significant difference between low- and high-profile industries and the level of their environmental disclosure. This means that environmental sensitive firms (high-profile) report a higher level of environmental disclosure than firms in low-profile industries, this is consistent with legitimacy theory.

In contrast to size and industry, profitability is not statistically significantly related to the level of environmental disclosure. This could be because of the financial crisis, started in 2008. Financial numbers could be disturbed due to the unexpected losses or financial precautions taken by the majority of firms. The five-year ROE and ROA average between 2004 and 2008 and the single ROE and ROA in 2008 are used to measure profitability. Nevertheless, this failed test for the relation between profitability and environmental disclosure is also consistent with prior research (Cowen et al. 1987; Hackston & Milne, 1996; Patten, 1991; Roberts, 1992). Using multiple measures of size and profitability contributes to the robustness of the results.

There are, however, limitations in this study that should be taken into account when interpreting the results. First, the time period in which this research is undertaken is insufficient to draw definite conclusions, particularly due to the development and improvement of reporting guidelines and sustainability issues after the period of analysis. However, this limitation is mainly an opportunity for further research. The analysis is based on cross-sectional observations; longitudinal analysis would give more insight into the environmental disclosure practices in the Netherlands. Second, content analysis is used as a measure for the quality of environmental disclosure. Brammer and Pavelin state that (2008, p.1186):

> An alternative approach would be an independent focus upon each individual indicator of quality. This would permit insight into whether indicators are complements or substitutes, as well as revealing the extent to which each is associated with particular firm or industry characteristics.

Third, only three variables are used to examine whether they influence the quality of environmental disclosure. Those three are chosen because of the ability to compare the results with existing literature. Other, less researched, variables like: ownership structure, country of ownership, environmental performance, corporate governance structures, organizational culture and media exposure could be investigated. Finally, the source used for environmental disclosure is the stand-alone CSR report of the company, or the annual report in absence of the CSR report. Information from other communication channels, like the corporate website or environmentally-related press releases is not addressed (cf. Aerts & Cormier, 2009). Furthermore, this study could be improved or extended by using a survey or conducting interviews as a research method in order to deepen the understanding of the variables that influence the reporting practices among Dutch firms.

Despite of the limitations, this research can contribute to the existing literature. It is one of the the first studies performed in the Dutch context and it is also one of the first studies that examines variables that influence the level of environmental disclosure by using the Clarkson et al. (2008) scorecard. The majority of the studies analyzed the presence or absence of environmental information or analyzed the quantity of the disclosed environmental information. However, this study has evaluated the scope, depth and length of environmental disclosure provided by a sample of listed firms in the Netherlands.

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APPENDIX A

Index assessing the quality of discretionary disclosures about environmental policies, performance and inputs

Hard disclosure items

(A1) Governance structure and managements systems (maximum score is 6)

1. Existence of a department for pollution control and/or management positions for env. managements (0-1)
2. Existence of an environmental and/or public issues committee in the board (0-1)
3. Existence of terms and conditions applicable to suppliers and/or customers regarding env. practices (0-1)
4. Stakeholder involvement in setting corporate environmental policies (0-1)
5. Implementation of ISO14001 at the plant and/or firm level (0-1)
6. Executive compensation is linked to environmental performance (0-1)

(A2) Credibility (maximum score is 10)

1. Adopting of GRI sustainability reporting guidelines or provisions of a CERES report (0-1)
2. Independent verification/assurance about environmental information disclosed in the EP report/web (0-1)
3. Periodic independent verifications/audits on environmental performance and/or systems (0-1)
4. Certification of environmental programs by independent agencies (0-1)
5. Product certification with respect to environmental impact (0-1)
6. External environmental performance awards and/or inclusion in a sustainability index (0-1)
7. Stakeholders involvement in the environmental disclosure process (0-1)
8. Participation in voluntary environmental initiatives endorsed by EPA or Department of Energy (0-1)
9. Participation in industry specific associations/initiatives to improve environmental practices (0-1)
10. Participation in other environmental organizations/assoc. to improve, environmental practices (if not awarded under 8 or 9 above) (0-1)

(A3) Environmental performance indicators (EPI) (maximum score is 60)[3]

1. EPI on energy use and/or energy efficiency (0-6)
2. EPI on water use and/or water use efficiency (0-6)
3. EPI on green house gas emissions (0-6)
4. EPI on other air emissions) (0-6)
5. EPI on TRI[4] (land, water, air) (0-6)
6. EPI on other discharges, releases and/or spills (not TRI) (0-6)
7. EPI on waste generation and/or management (recycling, re-use, reducing, treatment and disposal) (0-6)
8. EPI on land and resources use, biodiversity and conservation (0-6)
9. EPI on environmental impacts of products and services (0-6)
10. EPI on compliance performance (e.g. exceedances, reportable incidents) (0-6)

(A4) Environmental spending (maximum score is 3)

1. Summary of dollar savings arising from environment initiatives to the company (0-1)
2. Amount spent on technologies, R&D and/or innovations to enhance environ. perf. and/or efficiency (0-1)
3. Amount spent on fines related to environmental issues (0-1)

Soft disclosure items

(A5) Vision and strategy claims (maximum score is 6)

1. CEO statements on environmental performance in letter to shareholders and/or stakeholders (0-1)
2. A statement of corporate environmental policy, values and principles, environ codes of conduct (0-1)
3. A statement about formal management systems regarding environmental risk and performance (0-1)
4. A statement that the firm undertakes periodic reviews and evaluations of its environ. performance (0-1)
5. A statement of measureable goals in terms of future env. performance (if not awarded under A3) (0-1)
6. A statement about specific environmental innovations and/or new technologies (0-1)

(A6) Environmental profile (maximum score is 4)

1. A statement about the firms' compliance (or lack thereof) with specific environmental standards (0-1)
2. An overview of environmental impact of the industry (0-1)
3. An overview of how the business operations and/or products and services impact the environment (0-1)
4. An overview of corporate environmental performance relative to industry peers (0-1)

(A7) Environmental initiatives (maximum score is 6)

1. A substantive description of employee training in environmental management and operations (0-1)
2. Existence of response plans in case of environmental accidents (0-1)
3. Internal environmental awards (0-1)
4. Internal environmental audits (0-1)
5. Internal certification of environmental programs (0-1)
6. Community involvement and/or donations related to environ. (if not awarded under A1,4 or A2,7) (0-1)

[3] The scoring scale of environmental performance data is from 0 to 6. A point is awarded for each of the following items: (1) performance data is presented; (2) Performance data is presented relative to peers/rivals or industry; (3) performance data is presented relative to previous periods (trend analysis); (4) performance data is presented relative to targets; (5) performance data is presented both in absolute and normalized form; (6) performance data is presented at disaggregate level (i.e. plant, business units, geographic segment).

[4] TRI is an abbreviation for the poisonous chemical compound 'trichloroethylene' (C2HCl3), which is often used for industrial applications.

APPENDIX B

Environmental disclosure score per firm

	Shell	Unilever	Arcelor Mittal	KPN	ING	Philips	Heineken	Ahold	Unibail Rodamco	Akzo Nobel	Aegon	Reed Elsevier	ASML	TNT	Wolters Kluwer
A.1.1	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1
A.1.2	1	1	1	0	0	0	1	1	1	0	1	0	0	1	0
A.1.3	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0
A.1.4	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0
A.1.5	0	1	1	0	0	1	0	0	0	1	1	1	1	1	0
A.1.6	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	5	5	5	3	2	2	3	4	4	3	5	4	4	6	2
A.2.1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1
A.2.2	1	0	1	1	1	1	1	0	1	1	0	1	0	1	0
A.2.3	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0
A.2.4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
A.2.5	0	1	0	0	1	1	0	1	1	1	1	1	1	0	1
A.2.6	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1
A.2.7	1	1	1	0	1	0	1	1	1	0	1	0	0	1	1
A.2.8	1	1	1	0	1	1	1	0	1	1	0	1	0	1	1
A.2.9	1	1	1	1	1	1	0	1	1	1	0	1	1	0	0
A.2.10	1	0	0	1	1	1	0	1	0	1	0	1	0	1	0
Total	8	6	7	5	9	6	5	7	6	8	4	7	4	6	5
A.3.1	3	0	0	3	3	3	3	2	3	2	2	4	3	3	2
A.3.2	2	2	1	0	0	3	4	2	3	2	2	4	3	0	2
A.3.3	2	2	0	2	3	3	3	2	3	2	2	4	3	3	2
A.3.4	3	0	0	0	0		2	0	0	3	0	0	0	0	0
A.3.5	0	0	0	0	0	3	0	2	0	0	0	0	0	0	0
A.3.6	2	0	0	0	0		0	0	0	0	0	0	0	0	2
A.3.7	3	2	0	3	3	3	2	2	2	2	2	4	3	3	2
A.3.8	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0
A.3.9	0	1	0	0	0		0	0	0	0	0	0	0	0	0
A.3.10	3	0	0	0	0	1	2	0	0	0	0	0	2	2	0
Total	19	7	1	8	9	16	16	10	12	11	8	17	14	11	10
A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
A.4.2	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
A.4.3	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Total	0	0	0	0	0	1	1	0	0	0	0	0	0	3	0
A.5.1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1
A.5.2	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1
A.5.3	0	1	1	0	1	1	0	0	1	1	0	0	1	1	1
A.5.4	0	1	0	0	1	1	1	0	0	1	0	0	1	1	0
A.5.5	1	0	1	0	0	0	0	0	1	0	0	0	0	1	0
A.5.6	1	0	1	1	0	1	0	1	0	1	1	0	1	1	1
Total	4	4	5	3	4	4	2	3	4	4	3	2	5	6	4
A.6.1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1
A.6.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A.6.3	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0
A.6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	1	0	1	2	1	1	1	2	1	1	1	1	1	1
A.7.1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
A.7.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A.7.3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
A.7.4	0	0	0	0	1	1	1	1	0	0	0	0	1	1	0
A.7.5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
A.7.6	1	0	0	1	1	0	0	1	0	1	0	1	0	1	1
Total	1	1	1	1	3	1	1	2	0	2	0	1	1	2	1
Total Hard	32	18	13	16	20	25	25	21	22	22	17	28	22	26	17
Total Soft	6	6	6	5	9	6	4	6	6	7	4	4	7	9	6
Total Disc.	38	24	19	21	29	31	29	27	28	29	21	32	29	35	23

continuous

continued

	DSM	AirFrance KLM	Randstad	Corio	Fortis	Vopak	Fugro	Boskalis Westmin	SBM Offshore	Wereldhave	Logica	SNS	Van Landschot
A.1.1	1	1	0	1	1	0	0	1	1	0	1	0	1
A.1.2	1	1	0	1	1	0	0	0	0	0	1	0	0
A.1.3	1	1	0	1	1	0	0	0	0	0	0	1	0
A.1.4	1	1	1	1	1	1	0	0	0	0	0	1	0
A.1.5	0	1	0	0	1	0	0	1	1	0	0	0	0
A.1.6	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	5	1	4	5	1	0	2	2	0	2	2	1
A.2.1	1	1	1	0	0	1	0	0	1	0	1	1	0
A.2.2	1	1	0	0	0	0	0	0	1	0	0	0	0
A.2.3	0	1	0	0	0	0	0	1	0	0	0	0	0
A.2.4	0	0	0	0	1	0	0	0	0	0	0	0	0
A.2.5	1	1	0	1	0	0	1	0	0	1	1	1	1
A.2.6	1	1	1	1	1	0	0	0	0	1	1	1	0
A.2.7	1	1	0	1	1	1	0	0	0	1	1	1	0
A.2.8	1	1	1	1	0	0	0	0	0	1	1	1	1
A.2.9	1	1	0	1	1	0	1	0	1	0	1	1	0
A.2.10	0	1	0	1	0	0	1	0	0	0	0	0	0
Total	7	9	3	6	4	2	3	1	3	4	6	6	2
A.3.1	2	3	2	0	3	4	0	0	2	0	2	2	1
A.3.2	3	2	2	0	0	0	0	0	0	0	1	2	1
A.3.3	2	3	0	0	4	3	0	0	3	0	3	2	2
A.3.4	3	3	0	0	3	0	0	0	3	0	1	0	0
A.3.5	2	0	0	0	0	0	0	0	3	0	0	0	0
A.3.6	0	3	0	0	3	2	0	0	0	0	0	0	0
A.3.7	2	3	2	0	3	0	0	0	0	0	2	3	2
A.3.8	1	0	0	0	0	0	0	0	0	0	0	0	0
A.3.9	0	1	0	0	0	0	0	0	0	0	2	0	0
A.3.10	2	0	0	0	0	3	0	0	0	0	1	0	0
Total	17	18	6	0	16	12	0	0	11	0	12	9	6
A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0
A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0
A.4.3	1	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	0	0	0	0	0
A.5.1	1	0	0	0	1	1	0	0	1	0	0	0	0
A.5.2	1	1	1	1	0	1	1	1	1	1	1	1	1
A.5.3	1	0	0	0	1	0	1	0	1	0	1	0	0
A.5.4	0	1	0	0	0	0	0	0	0	0	1	0	0
A.5.5	1	1	0	1	1	0	1	0	0	1	1	1	0
A.5.6	1	1	0	1	1	1	0	1	1	1	1	1	0
Total	5	4	1	3	4	3	3	2	4	3	5	3	1
A.6.1	1	1	1	1	1	1	0	0	1	0	1	0	0
A.6.2	0	0	0	0	0	0	0	0	0	0	0	0	0
A.6.3	0	1	0	0	0	0	0	0	0	0	0	0	0
A.6.4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	2	1	1	1	1	0	0	1	0	1	0	0
A.7.1	0	0	0	0	0	0	0	0	0	0	0	0	0
A.7.2	0	0	0	0	0	0	0	0	0	0	0	0	0
A.7.3	0	0	0	0	0	0	0	0	0	0	0	0	0
A.7.4	1	1	0	0	0	0	0	1	0	0	0	0	0
A.7.5	0	0	0	0	0	0	0	0	0	0	0	0	0
A.7.6	0	0	0	1	0	0	1	0	1	0	0	1	0
Total	1	1	0	1	0	0	1	1	1	0	0	1	0
Total Hard	29	32	10	10	25	15	3	3	16	4	20	17	9
Total Soft	7	7	2	5	5	4	4	3	6	3	6	4	1
Total Disc.	36	39	12	15	30	19	7	6	22	7	26	21	10