[To the best of my knowledge this is the final version of this paper before it was published in Journal of Accounting & Organizational Change. I use the term «best of my knowledge» because 2009 is a long time ago, when I upload this to efallan.no in 2020.]

To cite: Fallan, E. & Fallan, L. (2009). Voluntarism versus regulation: Lessions from public disclosure of environmental performance information in Norwegian companies. *Journal of Accounting & Organizational Change*, 5(4), 472-489.

VOLUNTARISM VERSUS REGULATION: LESSONS FROM PUBLIC DISCLOSURE OF ENVIRONMENTAL PERFORMANCE INFORMATION IN NORWEGIAN COMPANIES[1]

Even Fallan
KPMG, Trondheim, Norway
e-mail: ibn@turmusic.no

and

Lars Fallan
Trondheim Business School, Trondheim, Norway
e-mail: lars.fallan@toh.hist.no

ABSTRACT

Purpose: The purpose of this paper is to explore the development of environmental disclosure during periods of voluntarism and during periods with changed statutory requirements. More specific, the question is how volume and content variety of environmental disclosure in financial statements are immediately affected by statutory regulations.

Design/methodology/approach: In order to compare the effects of such regulations with the development in environmental disclosure during periods without any changes in statutory requirements, a longitudinal study is conducted to test seven specific hypotheses. A quasi-experiment with pre- and post-testing of disclosure volume and content variety is carried out to test the effects of the statutory changes.

Findings: The most important lesson from this study is the significance of the voluntary approach to improve the variety of environmental disclosure. The present study supports the claim of voluntarism that companies will meet the heterogeneous requirements of their stakeholders without any governmental regulations. No statutory regulations are needed to make the companies increase and adapt their environmental disclosure to the demand from their stakeholders and legitimate their existence towards society. The present study has revealed that the regulation approach has a significant, immediate effect on mandatory environmental disclosure only, and that companies do not fully comply with such statutory regulations.

Research limitations/implications: There is no universal notion of voluntarism. Different countries and societies have different legal requirements and political cultures regarding voluntarism. That is, voluntary reporting in Norway is affected by the national statutory requirements and may be underpinned by a certain set of societal responsibilities that may or may not exist elsewhere. Further research is needed to see whether these findings are readily generalized or whether they should only be interpreted in light of local considerations.

[1] We gratefully acknowledge the constructive comments from two anonymous reviewers.

Originality/value: This is the first comprehensive study of the development of environmental disclosure in Norwegian companies. 822 financial statements and annual reports, during the period between 1987 and 2005, are analysed.

INTRODUCTION

Environmental impacts from business activities are under severe scrutiny from society and, consequently, the stakeholders are demanding more and qualitatively better environmental information from the companies. The companies have responded differently to this increasing demand for environmental information (Adams *et al.,* 1998). In this situation there is an ongoing discussion in the literature on voluntary disclosures versus regulating environmental information.

The voluntary approach to environmental disclosure claims that companies will meet the requirements of their stakeholders without any governmental regulations (Maltby, 1997). According to stakeholder theory, the companies will, on a voluntary basis, respond to stakeholders' needs for environmental disclosure (Donaldson and Preston, 1995; Maltby, 1997). Companies prefer voluntarism, because environmental regulations are expected to raise costs (Porter and van der Linde, 1995a).

The purpose of this paper is to explore development of environmental disclosure during a period of pure voluntarism, during periods with changed statutory requirements, and during periods of unchanged regulation and voluntarism. More specifically, the question is how volume and content of environmental disclosure in financial statements are immediately affected by statutory regulations. Furthermore, in order to compare the immediate effects of such regulations with the development in environmental disclosure, during periods without any changes in statutory requirements, a longitudinal study is conducted. The purpose of the longitudinal study is to explore the arguments of regulation versus those of voluntarism.

The paper is organized in the following way. The next section elaborates on voluntary versus regulated mandatory disclosures in a Norwegian setting. Then the theoretical foundations for expected development in environmental disclosure are discussed and hypotheses are developed. The phenomenon of environmental disclosure is discussed, and the appropriate research method is clarified. Thereafter findings are reported, conclusions are drawn and, finally, some implications are indicated.

LEGISLATION OF ENVIRONMENTAL DISCLOSURE IN NORWAY

Norway was the first country requiring all firms included by the Accounts Act (Regnskapsloven) to publish a clarification of whether they polluted the environment and to report executed and planned operations for appropriate environmental protection as from 1989. The Accounts Act and the Stock

Company Act (Aksjeloven) had the similar regulations: «The annual report shall give an account of whether the business pollutes the external environment and a summary of appropriate actions, which are carried out or planned to counteract such pollution». However, there were no requirements for a uniform report. How much to report and what type of content to make were almost entirely up to the company. The most usual statement in annual reports from companies, having no serious environmental impact fulfilling the statutory requirements, was: «The firm does not pollute the external environment». Even though the annual report was under auditing control, the environmental part of it was not. These limited regulations for environmental information should make it fairly easy and inexpensive for companies to fulfil the legal obligations. These mandatory requirements were modest. Actually, most environmental disclosure of information in annual reports should still be provided on a voluntary basis.

As from 1999 a new Accounts Act was implemented. The previous regulations were forwarded, but to some extent the requirements for environmental disclosure became more comprehensive in the new Accounts Act. If the impact was considered to be of significance, all firms had to disclose how the business affected the natural environment. The information should nevertheless be included in the annual report even if the firms had separate environmental reports or special environmental sections in their financial statements. However, in addition to the modest regulations from earlier the regulations in the new Accounts Act were extended to report environmental information on the entire product or service life cycle. The exact meaning of the new wording was not clear, therefore the Norwegian Accounting Standards Board made a preliminary standard, describing eight different conditions that are central to the external environment and, consequently, of importance to report (Norsk Regnskaps Stiftelse, 1999).

According to the Norwegian Government’s white paper (Ot.prp. nr. 42, 1997-98), the purpose of the change in statutory regulation of environmental reporting is to affect positively the environmental performance and to meet with the information needs of shareholders, investors, lenders, employees, authorities and the general public. The annual report is an object for auditing, but the environmental disclosure is still not (Nyquist, 2003). Another white paper (Ot.prp. 75, 1997-98) states that there is no need for external auditing of environmental information in the financial statement.

These two statutory changes in regulations, from 1989 and 1999 respectively, permit an exploration of the effects of regulation versus voluntarism. A closer look at the development of environmental disclosure in annual reports before and after these years of changes, will give an opportunity to analyze some differences between the regulation approach and the voluntary approach.

VOLUNTARISM VERSUS REGULATION

Legitimacy theory predicts that companies respond to pressure from society by providing voluntarily environmental information to legitimate their existence and to demonstrate society's need for their services (Adams *et al.,* 1998; Ljungdahl, 1999; Wilmhurst and Frost, 2000; Milne and Patten, 2002; O'Donovan, 2002). Gray *et al.* (1995) indicate that legitimacy and stakeholder theories have overlapping perspectives. Accounting researchers have suggested that corporate social responsibility (CSR) disclosures in annual reports improve legitimacy (Neu *et al.*, 1998). Self-reporting of environmental information on a voluntary basis in the financial statements has turned out to be of great importance for legitimacy, since such disclosures are the primary information source for stakeholders like investors, creditors, employees, suppliers, customers, environmentalists and the government (Patten, 1992; Hutchins, 1994; Epstein and Freedman, 1994). Neu *et al.* (1998) have revealed that within the financial stakeholder grouping (i.e. investors and creditors), the concerns of shareholders are the primary influence on the level of disclosure. However, pressure from regulators and environmentalists through media coverage was associated with the level of environmental disclosure, although in opposing directions. Media coverage given to environmental fines from regulators was associated with increased levels of environmental disclosure, whilst environmentalist criticisms were associated with a decreased level of environmental disclosure. Another finding was that general societal attention and media coverage were positively associated with the level of environmental disclosures in the annual report (Neu *et al.*, 1998). This finding indicates that, although annual reports communications are directed primarily to the financial stakeholder grouping, the concerns of the general public also influence disclosure levels.

Some studies reveal that legitimacy theory may be an explanation of environmental disclosure of volume in some cases, but not in others (Campbell *et al.,* 2003; Campbell, 2004). Voluntary environmental disclosure in annual reports can even be viewed as an innovation. Consequently, the extensive research on adoption of innovations has turned out to be a fruitful supplement to legitimacy theory in order to explain why companies vary in their ability and willingness to adopt environmental disclosure (Fallan and Fallan, 2007). According to the advocates of voluntarism, the companies will ensure that their environmental disclosures and performances are acceptable, and thereby provide information appropriate for the stakeholders (Wilmhurst and Frost, 2000).

Those who support regulated environmental information claim that at least a minimum of information is ensured by these regulations. The stakeholder approach implies that environmental disclosure will evolve in response to their requirements. This is not necessarily the case because the assumption that stakeholders will have similar information requirements may be wrong (Maltby, 1997; Neu *et al.*, 1998). For example, it is unlikely that investors will have the same information requirements as the environmentalists. Voluntary reports are also found to be incomplete, and they are not related to the firms' actual environmental performance. Both Deegan and Rankin (1996) and Niskanen and Nieminen (2001) revealed that positive information seemed to dominate the reports.

Voluntary disclosure makes the likelihood of opportunistic behaviour greater than under regulated information requirements. However, even mandatory environmental disclosures cannot stop strategic use of voluntary CSR (Larrinaga *et al.*, 2002; Mobus, 2005; Criado-Jiménez *et al.*, 2007), and only a minority of companies comply fully with the statutory regulations (Adams *et al.*, 1995). Companies may disclose environmental information according to their own self-interest, when future earnings and potential cash flows are negatively affected (Walden and Schwartz, 1997). The reports are more likely to appear as a specific event and the content will vary more widely when regulations are lacking. Environmental disclosure is mostly a legitimacy device and not an accountability mechanism, and according to Patten (2005) more legislation is not necessarily required to improve accountability, but rather better review and enforcement are needed. The argument is supported by Larrinaga *et al.* (2002), who have concluded that the regulation of environmental reporting would not lead companies to report on bad news.

Those who argue against regulations claim that firms in countries with regulations face considerable costs and therefore diminished competitiveness (Jaffe *et al.,* 1995; Porter an van der Linde, 1995a). Nyquist (2003) has given a brief survey of this literature, and she emphasized other studies which state that regulations in this field stimulate businesses to achieve higher efficiency, develop technological improvements and bring forth a higher corporate awareness (Porter and van der Linde, 1995b).Tietenberg (1998) claims that information strategies of environmental disclosure can probably motivate polluters to reduce emissions, even in the absence of statutory requirements. He concludes on the basis of his empirical findings that disclosure strategies can ultimately motivate polluters to reduce emissions even in the absence of more traditional regulatory controls.

The motivation for statutory requirements is that such regulations will limit adverse environmental impacts. However, there is no consensus as to how regulations affect business. Elkington *et al.* (1998) claim markets work most efficiently and effectively when there is adequate information. Consequently, the volume and content of environmental disclosure are important to secure the supply of such information. What regime is the best provider of adequate information? The answer to that question is closely connected to the environmental information provided in a regime of regulations compared with a regime of voluntarism.

If regulations should provide better environmental information than compared with voluntarism, the relative growth in volume and information content have to be significantly higher than in the year before the regulations are introduced. If not, the impact of regulations is disputable.

Consequently, we hypothesize support for the regulation approach in the Norwegian setting having statutory changes in 1989 and in 1999 in this way:

H_1: The relative annual growth of environmental disclosure of *volume* in financial statements compared with the previous year is positively affected by the introduction of legislation requiring all companies to report on the environmental impact of their activities (A) from *1989* and by the extended regulations (B) from *1999* also requiring all companies to report on the impact of products' life cycle.

H_2: The relative annual growth of environmental disclosure of *information content* in financial statements compared with the previous year is positively affected by the introduction of legislation requiring all companies to report on the environmental impact of their activities (A) from *1989* and by the extended regulations (B) from *1999* also requiring all companies to report on the impact of products' life cycle.

It has already been pointed out according to stakeholder theory, firms due to ethical reasons will respond to interest groups' demand for environmental information. Consequently, regulations will be unnecessary (Donaldson and Preston, 1995; Maltby, 1997). Legitimacy theory explains the willingness to disclose environmental information independent of regulations because firms want to legitimate their existence in society. Based on stakeholder theory and legitimacy theory, respectively, we hypothesize growth in environmental disclosure to meet with the increasing demand for such information from stakeholders or to legitimate their existence to match the increasing focus on environmental issues. As mentioned above, mandatory environmental disclosure cannot stop strategic use of voluntary CSR (Larrinaga *et al.*, 2002; Mobus, 2005; Criado-Jiménez *et al.*, 2007). Hence, we hypothesize that voluntary information content will constitute the most considerable part of the total environmental disclosure also during regimes of mandatory information requirements:

H_3: Voluntary information categories will constitute the most considerable part of the total environmental disclosure content also during periods with statutory regulations of mandatory information content.

Furthermore, previous research also indicates that companies do not fully comply with statutory regulations of environmental disclosure (Adams *et al.*, 1995; Walden and Schwartz, 1997). This is hypothesized below.

H_4: Companies will not comply fully with the statutory regulations of environmental disclosure information content.

According to the Norwegian statutory regulations, the mandatory environmental disclosure should always be included in the annual report. This legal obligation for companies exists irrespective of whether they are publishing separate environmental reports or special sections in their financial statement. The aspect of costs is emphasized in the debate on voluntarism versus regulations (Jaffe *et al.*, 1995; Porter and van der Linde, 1995a). During the years to come these regulations will increase the likelihood of substituting environmental disclosure volume in annual reports for separate reports and special sections.

H_5: The legal obligations to publish mandatory environmental disclosure in annual reports will over the years be related to substitution of environmental disclosure volume in annual reports for separate reports and special sections.

RESEARCH METHOD

Research design and sample

We have carried out this study as a quasi-experiment (Cook and Campbell, 1979) with pre-testing and post-testing of a sample of companies' environmental disclosures before and after the statutory regulations in 1989 and 1999. This quasi-experiment is designed to answer the research questions related to the first two hypotheses. The stimulus in these quasi-experiments is the changes in statutory regulations as from 1989 and 1999.

In order to provide a longitudinal review of environmental disclosure, to explore years before and long after regulations are implemented, a long period was selected. The development of environmental disclosure in 1987-88, 1990-98, and 2000-5 is not influenced by statutory regulation changes, and, hence, might be seen as a result of voluntary disclosure. However, the considerable work gathering data on volume and informational content has limited the period to what was practically feasible. The longitudinal analysis of a period of 19 years, from 1987 to 2005, included 822 annual reports and is conducted to answer the questions of voluntary development in environmental disclosure information.

The companies were selected among those listed on Oslo Stock Exchange (OSE). The public interest in these companies is greater than randomly selected firms among all companies which are obliged to submit annual accounts. They are bigger and thereby better suited to adopt new trends in disclosure. All OSE companies are required to make the same financial statements and annual reports. Unfortunately, neither OSE nor the National Register of Accounts has a common data base of annual reports, which also include notes and environmental supplements during the whole period of 19 years. However, there is a compulsory submission of annual reports to The National Library. Reports that could not be collected from other sources were collected from the library in hard-copy, since no microfilm was available.

Only some companies are listed on the stock exchange during the entire period, and, hence, the number of companies can vary from one year to another. Mergers and acquisitions and demergers and spin-offs during the 19 years have affected the sample of companies. Originally a stratified sample was randomly selected from two groups of companies at OSE. One group of companies consists of those ranked by the Norwegian Pollution Control Authority to run businesses having «serious environmental impact», and the other group did not. This sample is randomly supplemented to keep the proportion of companies from each group constant. The total sample varies from a minimum number of 34 companies in one year and up to 60 companies. Mean number over the period is 46,1 (SD = 8,4).

Operationalization of concepts

The literature reflects a debate on aspects of data in voluntary disclosure. There are different ways of measuring volume and information content of environmental disclosure. Campbell (2004) refers to two main issues. First, the unit of analysis and, second, what medium should be selected.

First, the debate on the unit of analysis concerns the most effective way of measuring the reporting of volume and information content. The meaning is first coded from phrase or sentence (Milne and Adler, 1999), and if the content is classified as environmental, then the coded disclosure is counted. The most commonly employed counting measures of *volume* are word count (e.g. Wilmhurst and Frost, 2000), sentence count (e.g. Deegan *et al.*, 2000) and page proportion count (e.g. Gray *et al.,* 1995). When choosing the disclosure of volume in the present study page proportion count is selected.

When it comes to *information content* of environmental disclosure, this should be based on a qualitative measurement. However, we have decided to convert the content variable into a quantitative measurement. The content is much more interesting than volume alone to describe the development of voluntary and mandatory environmental disclosure over years. Hence, the measurement of content is very important and a great effort is exercised to develop an appropriate method of gathering these data.

The second area of discussion in the literature is which media to use as a basis for data collection. According to Campbell (2004), the majority of previous studies have used the financial statement, including the annual report, as the basis of analysis for several reasons. The annual report is produced regularly, a substantial editorial input is used to develop it, and it is widely read (Deegan and Rankin, 1996; Grey *et al.*, 1995). However, the totality of a company's environmental communications towards the public should include other media used, e.g. environmental supplement to the annual report, separate environmental reports, internet web pages, stock exchange announcements and so on. Adams and Frost (2006) have examined the use of internet web pages to inform stakeholders about social and environmental performance, and so far, this potential is not fully developed. As for a considerable part of the longitudinal period studied here, none of these media were a feature of the reporting alternatives. Consequently, we have used the financial statement, including the annual report, and we have also collected data for separate environmental supplement and section to the annual report.

The categorization of information content of environmental disclosure is based on three main principles. (1) The list of categories should be complete, i.e. all possible and relevant environmental information should be included in one of the categories. (2) The categories are mutually exclusive, i.e. one type of information could only be included in one separate category and in no other. (3) The categories should either be mandatory or voluntary according to the statutory requirements.

The categorization is mainly based on United Nations Commission on Transnational Corporations about environmental disclosure in annual reports (UNCTC, 1991) and on a doctoral thesis about environmental disclosure in Swedish companies (Ljungdahl, 1999). We have added two more categories, and the present study includes 13 mutual exclusive categories for grouping information content of environmental disclosure (see Table 1). Fallan (2007) has detailed examples of how to classify according to these categories.

The measurement and the gathering of information are closely connected. The grouping of very heterogeneous types of information into 13 categories is a demanding task where grey areas very well may occur. Hence, the reliability could be threatened. Therefore we have decided to make the category variables dichotomous. If the environmental disclosure includes one type of information that belongs to a specific category, the value 1 is assigned, whether the type of information is one single sentence or a whole page. When using a nominal scale, much information is lost. However, the reliability will increase. Hence, the content variable will indicate the number of categories reported by the company. The total content variable can take on values up to 13. The content variable indicates the variety of a company's environmental reporting, and it can be divided into mandatory and voluntary categories respectively.

In the pure voluntary period 1987-88, there were nothing but voluntary information categories. As from 1989, there is a period of regulation and voluntarism, where the companies had statutory obligation either to report mandatory category no. 13, «No environmental impact», or mandatory category no. 3, «Environmental impact - process» (see Table 1). All the other information categories could be adopted on a purely voluntary basis. Companies that fully comply with the legal obligations should report one of these mandatory categories. As from 1999, the statutory obligations also included category no. 4, «Environmental impact - products». The legal obligations for companies are to report on either category no. 13 or no. 3 and in addition category no. 4. Actually, there were two mandatory categories to be reported by companies that fully comply with the statutory requirements in the period 1999-2005. The remaining 11 information categories could be voluntarily adopted.

Table 1
Environmental disclosure categories. Definitions/description.

No.:	Category:	Definition/description:
1	**Environmental policy**	Includes supereminent objectives and strategies. A minimum requirement is that priority of the environmental focus is expressed or an intention to follow an environmental program, e.g. The International Chamber of Commerce (ICC) Environmental Program, the Charter of World Business Council for Sustainable Development or a national environmental responsibility program. A statement saying that the company has an environmental policy is not sufficient to be included in this category.
2	**Environmental objectives**	To be included here it is required that the company reports specific and measurable goals derived from their environmental policy. For example an objective to decrease a specific discharge level of a substance in a definite period.
3	**Environmental impact - process**	Includes information about environmental impact from production processes as regards status and environmental improvements. Status includes: e.g. technical environmental accounts of pollution, waste and energy consumption; production methods; waste processing, and environmental risk. Environmental improvements includes: e.g. production process, and pollution.
4	**Environmental impact - products**	Like the above category 3; includes impact from products only.
5	**Environmental organization**	Includes information of how the company has organised their environmental work: e.g. responsibility, division of work, emergency preparedness to meet environmental requirements and disasters, development of environmental expertise, implementing of ISO 14001, the implementation of EMAS standards of environmental management and auditing. Specific auditing is excluded. See the below category 6.
6	**Environmental auditing**	Includes information about planned and completed environmental auditing acts (internal and external), reporting of auditing results and the company's follow-up work.
7	**Environmental authorities**	Includes information about present and future environmental constraints, green certificates, existing disputes, results of closed disputes, results of applications

		processing of discharge permits and so on.
8	**Environmental events**	Includes information about specific events that have caused environmental impacts; e.g. excess of discharge permit, serious environmental disasters.
9	**Environmental investments**	Includes economic information about completed investments to reduce the company's environmental impacts. Planned investments are excluded and belong to category 11 (environmental liabilities) below.
10	**Environmental costs**	Includes economic information about the environmental costs of the year. This is the change in environmental liabilities in accordance with accrual accounting. Environmental income and cost reduction are viewed as negative environmental costs. Information about future costs are classified in category 11 below.
11	**Environmental liabilities**	Includes information about future costs. Best estimate based on all available information should be adopted for contingent liabilities.
12	**Definition of environmental concepts/accounting principles**	Includes information about definition and clarification of environmental concepts. The category includes: e.g. clarifications, accounting principles, accounting rules, procedures relating to measurement, valuation and disclosure because of lacking accounting standards in this area.
13	**No environmental impact**	From 1989 Norwegian companies have to report whether the enterprise pollutes the environment in the financial statement There is no standard for this disclosure, but a common statement in the annual report is: «The company does not pollute the external environment.»

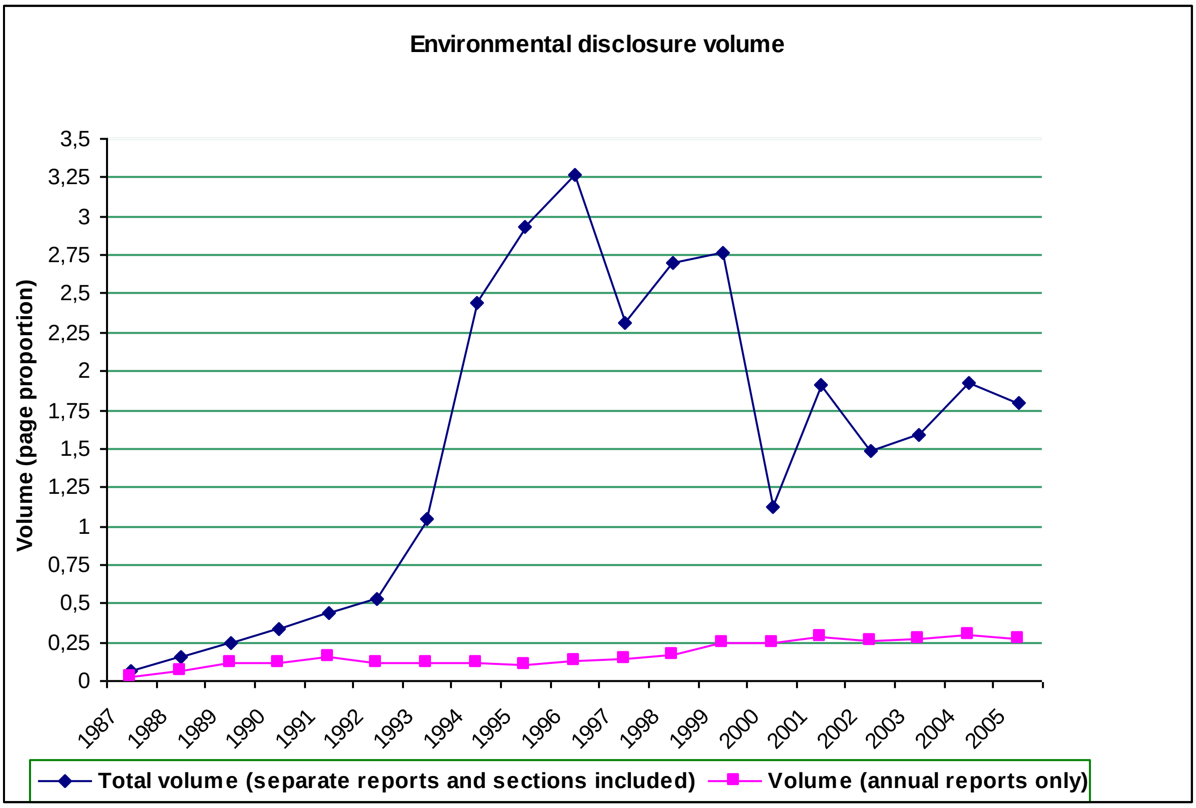
Source: Fallan (2007)

FINDINGS

Over the course of the 19 years of the study, the mean total volume of environmental disclosure, i.e. separate voluntary reports included, was low until a considerable increase was observed in the early 1990s. The volume reached a peak having over 3 pages on average in 1996, and decreased more or less until the early 2000s. The last five years of the period the total volume has reached stability of slightly under 2 pages on average (Figure 1).

On the other hand, the mean volume of environmental disclosure in annual reports only, i.e. separate voluntary reports excluded, increases up to 1991 and decreases more or less until 1995. From 1995 the disclosure volume increased up to 2001. During the 2000s, the volume seems to have reached stability slightly below 0.3 pages. The increase in disclosure volume in annual reports begins at the same time as we observed a decreasing total volume due to a decrease in separate environmental reports. Figure 1 indicates partly substitution of annual report disclosure for separate environmental reports (H_5). No credible test is carried out to confirm whether this is a significant development. However, Figure 1 seems to indicate that the legal obligation to publish mandatory environmental disclosure in the annual report over time reveals less use of voluntary separate environmental reports. We need to scrutinize this development over a longer period being able to conclude whether this is a permanent trend.

Figure 1



Part A of the first hypothesis (H_{1A}), which predicts that the annual growth of environmental disclosure of volume in financial statements is positively affected by the introduction of legislation requiring all companies to report the environmental impacts of their activities as from 1989 compared with the previous year, is not supported (Table 2). There is no significant change in the relative increase in total disclosure volume from the year before the regulations were implemented. On the other hand, there is only support for an expected relative increase in mandatory disclosure volume in annual reports in 1989 (Table 2).

Table 2

Changes in volume of environmental reporting between years

Hypothesis	**Differences between years**	**Volume change - total** (Mean volume, annual reports and separate environmental reports included)		**Volume change – annual reports** (Mean volume, only annual reports included)	
		t-value	**p**	**t-value**	**p**
H_{1A}	1988 – 1987 vs. 1989 - 1988	-0,52	.61	-3,10	.00
	1989 – 1988 vs. 1990 - 1989	0,47	.64	2,36	.02
H_{1B}	1998 – 1997 vs. 1999 - 1998	0,12	.90	-2,11	.04
	1999 – 1998 vs. 2000 - 1999	1,53	.13	1,06	.30

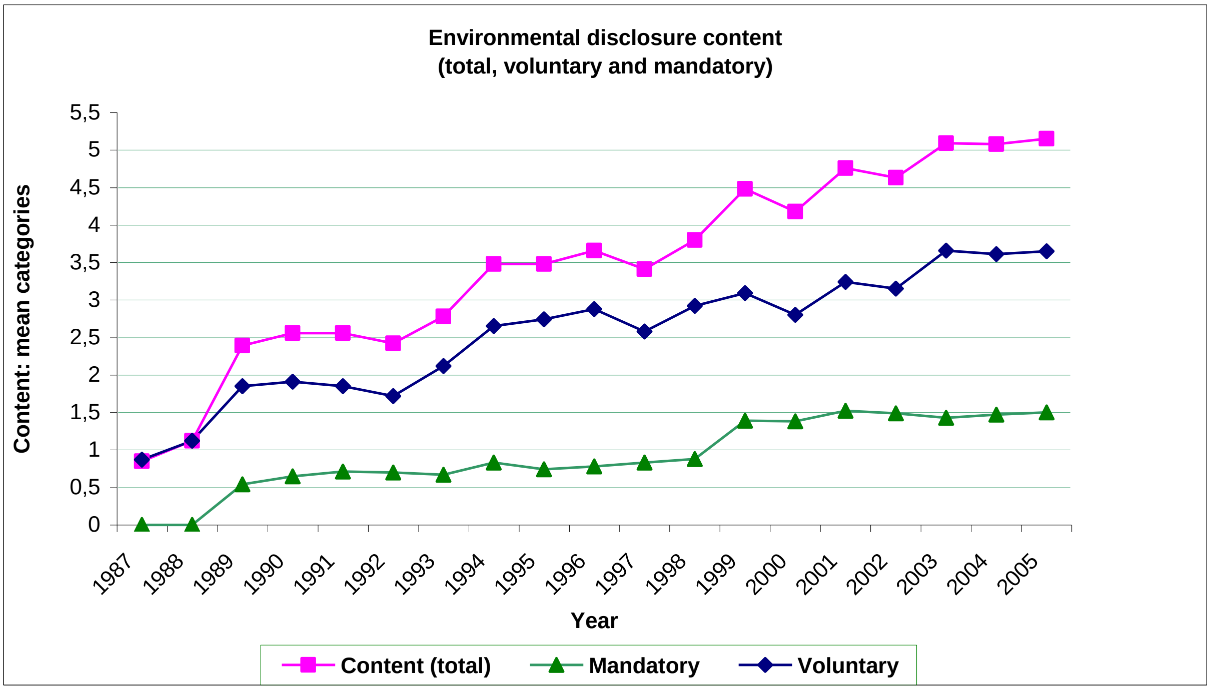
p = 2-tailed significance level

As from 1999, the new Accounts Act, which had more comprehensive requirements for environmental disclosure, was implemented. Part B of the first hypothesis (H_{1B}), predicting growth in disclosure volume in 1999 compared with the previous year, was neither supported, when it comes to total volume change. The slight growth in total disclosure volume is not significant. Only expected growth in mandatory disclosure volume in annual reports is supported (Table 2).

Neither the total disclosure volume in 1989 nor the total volume in 1999 has turned out to be significantly affected by these legal regulations compared with the previous years. However, the total disclosure volume used to test the hypotheses (H_{1A} and H_{1B}) in Table 2 included separate environmental reports and sections. The change in statutory regulations according to the Accounts Act requires the companies to provide the environmental information in the annual report, even if the company had separate environmental reports or special environmental sections in their financial statements. We have already revealed a possible substitution effect, according to the last hypothesis (H_5), but a closer inquiry into this development is needed.

Hence, we have tested for changes of disclosure volume in the annual report, i.e. where separate environmental reports or sections are excluded. These volume changes are also presented in Figure 1 and Table 2. This measurement of volume should be directly influenced by the regulations in 1989 and in 1999. If the regulations affect volume significantly, the growth in these years should be higher than in the previous years. Table 2 reveals a significantly higher growth in environmental volume in the annual report in 1989 than in 1988. The growth in volume is also significantly higher in 1989 than in the following year. When the next regulation was implemented in 1999, Table 2 reveals that the growth in disclosure volume in annual reports, i.e. voluntary separate environmental reports excluded, is significantly higher than in the previous year. Consequently, both hypotheses (H_{1A} and H_{1B}) are supported, only when it comes to expected changes in mandatory disclosure volume in annual reports.

Figure 2



The total information content of environmental disclosure consists of voluntary and mandatory information categories, and the total information has developed from an average of one category reported up to an average over 5 categories in the course of the 19 years period (Figure 2). The voluntary information was one category in average at the beginning of the period and has increased to a level slightly below 4 categories in 2005. Before 1989 there were no statutory obligations to report. A close look at Figure 2 reveals support for the hypothesis (H_3) that the voluntary information categories constitute the most considerable part of the total environmental disclosure content during all years of statutory regulations and voluntarism, i.e. from 1989 to 2005.

From 1989 to 1998 the mandatory information should have been one category, if all companies fully complied and two categories in the entire period from 1999 to 2005. Actually, the mandatory information content in Figure 2 is slightly under one category, even at the end of the first period, and it does not reach more than an average of 1.5 categories at the end of the second period. This development of mandatory disclosure content in Figure 2 supports hypothesis (H_4), which says that companies will not fully comply with statutory regulations of environmental disclosure.

Table 3
Changes in information content of environmental reporting between years (total, mandatory, voluntary)

Hypothesis	Differences between years	Information content change – total (Mean number of categories, all included)		Information content change – mandatory (Mean number of mandatory categories)		Information content change – voluntary (Mean number of voluntary categories)	
		t-value	p	t-value	p	t-value	p
H_{2A}	1988 – 1987 vs. 1989 - 1988	-3,99	.00	-6,81	.00	-2,30	.03
	1989 – 1988 vs. 1990 - 1989	3,25	.00	3,75	.00	2,35	.03
H_{2B}	1998 – 1997 vs. 1999 - 1998	-1,35	.18	-3,26	.00	-0,12	.91
	1999 – 1998 vs. 2000 - 1999	2,12	.04	2,55	.02	0,91	.37

P = 2-tailed significance level

When it comes to part A and part B of the second hypothesis of how information content is affected by changes in statutory regulations (H_{2A} and H_{2B}), the results are included in Table 3. Part A of the second hypothesis (H_{2A}) is strongly supported, i.e. the total information content is positively affected in 1989, compared with the previous year. This increase in the mean number of categories reported is also significantly higher than in the following year for both mandatory and voluntary information. Hence, the total information content is significantly affected.

Part B of the second hypothesis (H_{2B}) is supported only when it comes to changes in mandatory information content affected by the statutory changes in 1999. There is a significant growth in mandatory information content in 1999 compared with the previous year. This is not the case for voluntary information content, and, consequently, the growth in total information content is not significant either.

As already pointed out, the voluntary disclosure of information content was significantly affected by the regulation in 1989. However, the growing voluntary information content developed further in the 1990s and in the early 2000s, even though there were no changes in statutory regulations (Figure 2). Actually, the new statutory regulation in 1999 did not immediately affect voluntary disclosure of information content compared with the foregoing years and the years to come.

DISCUSSION

The purpose of this longitudinal study was to explore some differences between regulation of environmental disclosure and voluntary disclosure. We have put forward five hypotheses on the basis of these arguments. By testing these hypotheses, the study has revealed some results, which can improve our knowledge on the question of regulation versus voluntarism.

There is no support for regulations to affect disclosure of volume in financial statement when annual reports and volume of separate environmental reports and special environmental sections are included. However, the regulations in 1989 and 1999 required environmental information to be included in the annual report, even though the firm had separate environmental reports or special sections added to their financial statement. From the mid 1990s we observe a substitution of environmental disclosure of volume in annual reports for environmental disclosure of volume in separate reports and sections. Looking at environmental disclosure of volume in the annual reports exclusively, there is a significant increase from the previous year for the statutory regulation in 1989 as well as in 1999. The regulations had a significant and positive effect on the environmental disclosure of volume in annual reports only, as intended. However, the total volume of environmental disclosure in financial statements has decreased. The growth in mandatory disclosure volume in annual reports has not been sufficient to balance the reduced voluntary volume in separate environmental reports and sections.

There is a possibility that these modest regulations might legitimate firms to decrease their volume of voluntary environmental disclosure published in separate reports and sections. The firms might discover that their voluntary reporting so far had been more extensive than the modest legal requirements as from 1989. Consequently, modest regulations might legitimate the companies to decrease voluntary environmental disclosure volume.

The environmental information value depends not only on volume. The content is most important. The content variety of environmental disclosure measured by the growth of average number of information categories reported in the financial statement is significantly higher in 1989 than in the previous year and the year to follow. The regulations from 1989 only required the companies to report either whether the business pollutes the external environment (category no. 13), or if so, to make a summary of appropriate actions, which are carried out or planned to counteract such pollution (category no. 3). However, unlike the missing link between these regulations and a relative change in total volume, these modest statutory requirements had a positive effect on the content of environmental disclosure. Both mandatory and voluntary information content were affected. Consequently, the first introduction of statutory requirements in 1989 had an immediate effect on information content. The development of richer voluntary information content continued during the 1990s, irrespective of further legal changes. This growth indicates that voluntary information content is more likely triggered by pressure, legitimacy and stakeholders' need for environmental information rather than legal requirements. This supports the findings by Neu *et al.* (1998) and that voluntary reporting develops according to legitimacy and stakeholder theories.

The new Accounts Act implemented in 1999 had more comprehensive environmental disclosure requirements than the regulations from 1989. However, the relative increase in total environmental content did not differ significantly from the previous year. The increase in mandatory information content is significantly affected, but the regulation approach did not have the expected effect on the total environmental disclosure, because voluntary information content was not significantly affected. Actually, the growth of voluntary environmental disclosure content during the periods 1990 – 1998 and 2000 – 2005, where no statutory changes were implemented, favours a voluntary approach, where the driving forces are other than legal changes.

As expected, the regulation approach significantly affected mandatory disclosure information content. However, the present study has revealed that companies do not fully comply with the mandatory requirements of environmental information content and, hence, our results support the findings by Larrinaga *et al.* (2002). Since the environmental part of the annual report is not under auditing control, more legislation requirements are not necessarily required to improve compliance, but rather better review and enforcement are needed. Patten (2005) reached a similar conclusion to improve accountability of environmental disclosure. Furthermore, this study has revealed an adverse effect of the regulation approach. Compulsory obligations to publish mandatory environmental information in annual reports instead of separate voluntary reports, might have affected the total volume of environmental disclosure. This decrease in total disclosure volume might probably be a cost effective way for the companies adapting to the regulations. On the other hand, the total information content has increased, most of all, due to the development of voluntary information content during these years. Even in the period of decreased volume of environmental disclosure from 1996, the information content has increased. This reveals a development of more concentrated and varying environmental disclosure in annual reports from the mid 1990s.

The voluntary environmental information variety has almost quadrupled during these 19 years. This might be the companies' voluntary response to pressure from society, need to legitimate their existence or meet with the stakeholders' needs. Evidently, a regime of voluntarism is easily combined with a regulatory regime to provide adequate information for their stakeholders (Wilmhurst and Frost, 2000).

Actually, stakeholders are not a homogeneous group and counts customers, shareholders, employees, suppliers, competitors, local community groups, environmental pressure groups, government etc. The environmental information requirements of some stakeholders matter more for a company than those of others. Neu *et al.* (1998) have revealed that within the financial stakeholder grouping, the concerns of shareholders are the primary influence on the level of disclosure. Under a voluntary regime a company evidently will be eager to fulfil the requirements of those stakeholders that matter most to the company (Wilmhurst and Frost, 2000). The annual reports communications are directed primarily towards the financial stakeholders. The increase in disclosure volume from these annual reports might be a voluntary response from companies and not only affected by statutory requirements in 1989 and 1999. The growth in voluntary content of environmental disclosure in periods of no changes in statutory requirements can be viewed as a flexible way to comply with the stakeholders' needs.

CONCLUSIONS AND IMPLICATIONS

The present study has revealed that the limited scope of the regulation approach has a significant effect on mandatory environmental disclosure volume and content in annual reports only. However, even years after the introduction of the statutory regulations, the results from the present study reveal lacking compliance among companies. Based on our findings, there should have been one mandatory content category in all the years from 1989 and two categories in the period from 1999. This is not the case. Regulations without close review, auditing control and enforcement will not motivate full compliance. This is one of the lessons from the present study.

However, the most important lesson from this study is the significance of the voluntary approach to improve the variety of environmental disclosure to comply with heterogeneous needs of the stakeholders. According to Maltby (1997), the supporters of voluntarism need to prove that their approach empowers stakeholders. The present study gives support to the voluntary approach. The growth of voluntary information content did not stop after the first statutory regulation in 1989. During the entire period the voluntary environmental information content quadrupled from slightly less than 1 up to nearly 4 information categories on average (Figure 2). This study supports the claim from supporters of the voluntary approach (Donaldson and Preston, 1995) that companies will meet the heterogeneous requirements of their stakeholders without any governmental regulations.

The development of environmental disclosure, after the latest change in statutory regulation in 1999 and during the 2000s, reveals the same picture as in the previous period, i.e. a decrease of the total volume, a small increase in annual report volume and increased information content variety. During the entire period, we observe the total environmental disclosure to be more concentrated by decreased disclosure volume and increased content variety. The statutory regulations requiring mandatory reporting in annual reports probably trigger a process, where companies on a voluntary basis, are adapting to the legal requirements by substituting environmental disclosure in annual reports for separate reports and special sections. The growth in environmental information content variety is mostly due to the development of voluntary reporting. This development might be interpreted as a cost effective adaptation of the environmental disclosure. Even if the information volume is decreased, the information value is increased due to more heterogeneous information content. Consequently, this study argues in favour of the voluntary approach picturing more concentrated and content intensive environmental disclosure during a period of no statutory regulation changes.

Strategic use of voluntary environmental disclosure is no part of the present study. However, we know from Larrinaga *et al.* (2002), Mobus (2005) and Criado-Jiménez *et al.* (2007) that legal regulations and mandatory environmental disclosure cannot stop strategic use of voluntary disclosure. Positive information seems to dominate voluntary environmental reporting (Deegan and Rankin, 1996; Niskanen and Nieminen, 2001). Actually, voluntary disclosure content develops independent of statutory requirements and this information constitutes the majority part of the companies' environmental disclosure. Hence, this comprehensive voluntary reporting underlines the need for auditing, review and enforcement to improve accountability rather than more regulations.

The regulation approach has an immediate effect on mandatory disclosure. The last lesson from this study is that statutory regulation only justifies implementation, to ensure a minimum standard of environmental disclosure that all companies should provide. No statutory regulations are needed to make the companies increase and adapt their environmental disclosure to the demand of their stakeholders and legitimate their existence towards society. Hence, the Government should primarily give priority only to statutory requirements of environmental information categories neglected by the companies.

However, there is no universal notion of voluntarism and, therefore, different countries and societies have different political cultures regarding voluntarism. According to Norwegian statutory requirements, all the thirteen information categories are voluntary in 1987 – 1988, eleven of the thirteen categories are voluntary in 1989 – 1999, and, finally, ten of the thirteen environmental disclosure categories are voluntary in 1999 – 2005. Environmental reporting in Norway is affected by these statutory requirements, and it may be underpinned by a certain set of societal responsibilities that may or may not exist elsewhere. Further research is needed to analyze whether these findings are readily generalized or only should be interpreted in light of local considerations.

REFERENCES

Adams, C.A., Coutts, A., Harte, G. (1995). Corporate equal opportunities (non-) disclosure. *The British Accounting Review* 25, 87-108.

Adams, C.A., Hill, W.-Y., Roberts, C.B. (1998). Corporate social reporting practices in Western Europe: legitimating corporate behaviour? *The British Accounting Review* 30 (1), 1-21.

Adams, C.A., Frost, G.R. (2006). The internet and change in corporate stakeholder engagement and communication strategies on social and environmental performance. *Journal of Accounting & Organizational Change* 2 (3), 281-303.

Campbell, D. (2004). A longitudinal and cross-sectional analysis of environmental disclosure in UK companies – a research note. *The British Accounting Review* 36, 107-117.

Campbell, D., Craven, B., Shrives, P. (2003). Voluntary social reporting in three FTSE sectors: a comment on perception and legitimacy. *Accounting, Auditing & Accountability Journal* 16 (4), 558-581.

Criado-Jiménez, I., Fernández-Chulián, M., Husillos-Carqués, F.J., Larrinaga-González, C. (2007). Compliance with mandatory environmental reporting in financial statements: the case of Spain (2001-2003). *Journal of Business Ethics* 79, 245-262.
Deegan, C., Rankin, M. (1996). Do Australian companies report environmental news objectively? *Accounting, Auditing & Accountability Journal* 9 (2), 50-67.
Deegan, C., Rankin, M. Voght, P. (2000). Firms' disclosure reactions to major social incidents: Australian evidence. *Accounting Forum* 24 (1), 101-130.
Donaldson, T., Preston, L. (1995). The stakeholder theory of the corporation: concepts, evidence and implications. *Academy of Management Review* 20, 65-91.
Epstein, M.J., Freedman, M (1994). Social disclosure and the individual investor. *Accounting, Auditing & Accountability Journal* 7, 94-104.
Fallan, E. (2007). *Miljørapportering i norske selskaper 1987-2005. En empirisk undersøkelse av rapporteringspraksis i et innovasjonsteoretisk perspektiv.* [In Norwegian] HAS-utredning. Bergen: Norwegian School of Economics and Business Administration.
Fallan, E., Fallan, L. (2007). A longitudinal and cross-sectional analysis of volume and content of corporate environmental disclosure in Norwegian companies: A research note on innovativeness and adoption. Working paper Trondheim Business School, *TØH-serien* No. 5/2007
Gray, R., Kouhy, R., Lavers, S. (1995). Methodological themes: Constructing a research database of social and environmental reporting by UK companies. *Accounting, Auditing & Accountability Journal*, 8 (2), 78-101
Hutchins, H.R. (1994). Annual reports… Who reads them? *Communication World*, 11, 18-21
Jaffe, A.B., Peterson, S.R., Portney, P.R., Stavins, R.N. (1995). Environmental regulation and the competiveness of U.S. manufacturing: what does the evidence tell us? *Journal of Economic Literature* 33, 132-163.
Larrinaga, C., Carracasco, F., Correa, C., Llena, F., Moneva, J.M. (2002). Accountability and accounting regulation: the case of the Spanish environmental disclosure standard. *The European Accounting Review* 11 (4), 723-740.
Ljungdahl, F. (1999). *Utveckling av miljöredovisning i svenska börsbolag – praxis, begrepp, orsaker.* [In Swedish] Lund Studies in Economics and Management, No. 50. The Institute of Economic Research, Lund University. Lund University Press.
Maltby, J. (1997). Setting its own standards and meeting those standards: voluntarism versus regulation in environmental reporting. *Business Strategy and the Environment* 6, 83-92.
Milne, M.J., Adler, R.W. (1999). Exploring the reliability of social and environmental disclosures content analysis. *Accounting, Auditing & Accountability Journal* 12 (2), 237-256
Milne, M.J., Patten, D.M. (2002). Securing organizational legitimacy. An experimental decision case examining the impact of environmental disclosures. *Accounting, Auditing & Accountability Journal* 15 (3), 372-405
Mobus, J.L. (2005). Mandatory environmental disclosures in a legitimacy theory context. *Accounting, Auditing & Accountability Journal* 18 (4), 492-517.
Nau, D, Warsame, H., Pedwell, K.(1998). Managing public impressions: Environmental disclosures in annual reports. *Accounting, Organizations and Society* 23 (3), 265-282
Norsk Regnskaps Stiftelse (1999). *Foreløpig Norsk Regnskaps Standard for Årsberetning*. Oslo: Bedriftsøkonomens Forlag.
Nyquist, S. (2003). The legislation of environmental disclosures in three Nordic countries – A comparison. *Business Strategy and the Environment* 12, 12-25.
O'Donovan, G. (2002). Environmental disclosures in the annual report. Extending the applicability and predictive power of legitimacy theory. *Accounting, Auditing & Accountability Journal* 15 (3), 344-371
Ot.prp. nr. 42 (1997-98). *Om lov om årsregnskap*. Government Bill, Oslo, Norway.
Ot.prp. nr. 75 (1997-98). *Generelt om regulering av revisorer og revisjon*. Government Bill, Oslo, Norway.

Patten, D.M. (1992). Intra-industry environmental disclosures in response to the Alaskan oil spill: a note on legitimacy theory. *Accounting, Organizations and Society* 17, 471-475.

Patten, D.M. (2005). The accuracy of financial report projections of future environmental capital expenditures: a research note. *Accounting, Organizations and Society* 30, 457-468

Porter, M., van der Linde, C. (1995a). Green and competitive. *Harvard Business Review* Sept/Oct, 120-134.

Porter, M., van der Linde, C. (1995b). Toward a new conception of the environment – competitiveness relationship. *Journal of Economic Perspectives* 9, 97-118.

Tietenberg, T. (1998). Disclosure strategies for pollution control. *Environmental and Resource Economics* 11, 587-602

UNCTC (1991). *Accounting for environmental protection measures.* UN Commission on Transnational Corporations. Report of the Secretary-General. Document E/C.10/AC.3/1991/5.

Wilmhurst, T.D., Frost, G.R. (2000). Corporate environmental reporting. A test of legitimacy theory. *Accounting, Auditing & Accountability Journal* 13 (1), 10-21