

Determinants of Sustainability Disclosure in the Global Forest Industry

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Abstract

This study aims to investigate the current patterns and determinants of sustainability disclosure in the global forest industry. Under the extensive quantifiable measures and occurrences of the Global Reporting Initiative (GRI) framework, a content analysis is performed on the voluntary disclosure of 66 largest forest companies worldwide to evaluate their economic, environmental and social performance. By taking industry and firm characteristics into account, the study also seeks to shed more light on the key determinants influencing the quality and level of disclosure. Significant emphasis was found to be placed on environmental and economic issues in contrast to areas such as human rights, labour practices, social and product responsibilities in the forest industry. The results of regression analysis suggest that company size and business diversity are significantly associated with disclosure, whereas profitability and regional differences are not decisive factors in formulating sustainability reporting strategies in the forest industry.

Keywords

Forest industry, sustainability disclosure, Global Reporting Initiative, resource-based view, regression analysis

Introduction

The ever-growing public consensus of sustainable development and the recent corporate scandals have triggered the criticism of the conventional financial reporting (Guthrie and Boedker, 2006) and its ability and accountability to report business activities of a firm (Elkington, 1997). To date, while there is no universal framework existing, a number of reporting frameworks have been developed to integrate economic, environmental and social performance into a composite unified account (see, for example, Yongyanich and Guthrie, 2006), including the Triple Bottom Line, the Balanced Scorecard, the Intellectual Capital, and the award schemes by The Association of Chartered Certified Accountants (ACCA). Despite of the fact that all these internationally recognized reporting frameworks vary and prevail from industry to industry, or from region to region, the Global Reporting Initiative (GRI) deserves most attention among the most important drivers for the quality of sustainability reports.

Although there is a growing wealth of disclosure literature in the area of many industries (e.g., oil and gas, financing, banking, mining), research on corporate responsibility (CR) or sustainability disclosure (hereafter sustainability disclosure) under the GRI reporting framework has been scarce. This is particularly true in the forest sector, which is believed to play a crucial role in the future sustainable development. The growing public interest in and global consciousness of environmental and social issues has also intensified pressures on forest industry companies in their efforts to effectively counterbalance potentially conflicting stakeholder demands, and forced the companies to rethink their business strategies. Research in the field of sustainability disclosure is, in general, motivated by a desire to see improvement in the sustainability performance of companies (Adams and Larrinaga González, 2007), but assumptions have often been made with qualitative approaches.

In conducting the present study of CR-reporting in the global forest industry at least two issues were considered to be in

favor of choosing this sector as the target of our investigation. First, although CR is a highly context-specific construct, research on sustainability disclosure within individual sectors and industries is limited derived from of an international convergence on the reporting practices of the world's largest companies. Among environmentally-sensitive sectors, the forest-based industry has a crucial role in global sustainable development, but is frequently under-represented in generic studies of CR practice or reporting. Second, the global forest industry is currently experiencing globalization of markets, consolidation and vertical integration, resulting that the business is becoming increasingly determined by a diminishing number of transnational companies, which are facing mounting public distrust and intensified stakeholder pressure to become more accountable and transparent in their efforts to effectively balance potential conflicting stakeholder demands (Li and Toppinen, 2010). To our knowledge, with the exception of Toppinen et al. (2010), CR reporting of global forest industry or the application of GRI guidelines in ascertaining the industry's CR profile has not been studied earlier despite the importance of the sector in the global sustainability arena. To fill this gap, our study aims to investigate the changing patterns of economic, environmental and social performance of the forest industry under the GRI framework. This is done through a quantitative content analysis on CR disclosure by the top 100 forest-based companies ranked by PPI in terms of net sales and production. First, the descriptive part of the study reveals the divergence of sustainability reporting profiles between different groups. The second part of the study tries to identify the differences in the sustainability disclosure practices by testing the association between firm-specific factors and the level of disclosure using linear regression analysis. Altogether the study is designed to provide new insights into the state-of-the-art of sustainability disclosure of the global forest industry from a quantitative perspective. This study therefore extends prior research by directly examining the patterns and determinants of the largest

forest companies worldwide, and providing a novel assessment of voluntary reporting under the GRI guidelines.

Theoretical background

GRI Guidelines for corporate disclosure

The availability of environmental and social performance data is recognized critically important in contemporary business management, providing a basis for social and environmental analysis of the current business environment. It is also a key component of financial performance analysis, because current financial disclosure requirements alone do not reveal all of the risks, liabilities, or advantages associated with a corporation's activity. Corporate disclosures on environmental and social performance are also viewed as a commitment to transparency and as efforts to address social and environmental risks as indicators of strong corporate governance. There are indications (e.g., Freeman, 1984) aligning with the resource-based view (RBV) that company's strong performance in addressing primary stakeholder benefits are able to create long-term shareholder value through the development of intangible valuable assets into competitive advantage.

The GRI framework is considered the most comprehensive reporting guideline available to date, and one that has gained broad credibility through a rigorous, global multi-stakeholder feedback process. The GRI framework provides extensive measures and occurrences for report content. Beyond its specific indicators, at the heart of the GRI is a commitment to eleven reporting principles: transparency, inclusiveness, auditability, clarity, completeness, relevance, sustainability context, accuracy, neutrality, comparability, clarity and timeliness (each of these is explained in detailed within the GRI guideline documents). These principles can be viewed as bedrocks for all credible corporate sustainability reporting. The good faith efforts to apply these principles result in reports that are more valuable for report users and the companies engaged in reporting alike.

The GRI was developed, in part, to prevent survey fatigue, for example. The World Business Council for Sustainable development (WBCSD) estimates that the GRI framework covers 80 percent of the data asked for across the range of standard socially responsible investment (SRI) related screening and benchmarking surveys. A growing number of companies have declared their adoption of the GRI in their reporting. Companies are also encouraged to work towards reporting "in accordance" with the GRI guidelines, enabling the flexibility of choosing which performance indicators to use, but requiring companies to include an explanation if they do not report on all the core GRI indicators. As the most dominant reporting standard up-to-date, the GRI framework has received support from numerous stakeholder groups, including for-profit and not-for-profit organizations, accounting regulatory bodies, investors and trade unions (Perrini, 2005). By 30th September 2010, there were 1336 international companies from more than 60 countries used some or all of the GRI guidelines (www.globalreporting.org). For companies facing the ever-increasing scrutiny and stakeholder demand for transparency and accountability, the adoption of the GRI framework enables the company with greater confidence in sustainability disclosure. In addition, some environmentally-sensitive sectors such as the oil and gas, mining and chemical industries, or not-for-profit organizations facing needs that require specialized guidance in addition to the universally applicable core guidelines, have built sector supplements responding to these concerns. However, no such supplement is developed for the forest-based industry yet, although the sector has been

claimed to have very many important sector-specific characteristics in terms of its implementation of CR.

Figure 1 illustrates the theoretical framework of our study, which is operationalized based on the GRI framework (2006). As can be seen in Figure 1, the three main domains of the GRI framework beside the conventional economic, environmental and social responsibilities are human rights, labour practices and product responsibility. The GRI framework provides guidance on how organizations can disclose their sustainability performance with guidelines, protocols, sector supplements, detailed list of performance metrics and other disclosure items. Specifically, there are three types of standardized disclosure under the GRI framework: 1) on strategy and profile, which provide a high-level strategic view of the organization's approach to sustainability; 2) on the management approach, which provides concise disclosures of the organization's specific approach to its economic, environmental and social performance; and 3) listing of 79 specific performance indicators pertaining to six domains of the GRI framework, which measure the organization's overall CR responsibility performance.

Previous research on corporate disclosure and formulation of research hypotheses

Previous studies on (voluntary) corporate disclosure have shown critical reflections on the quality and reliability (Gallhofer and Haslam, 1997), the largely qualitative nature (conventional annual reports in particular) (Deegan and Gordon, 1996), the measurability, credibility or comparability (Gray, 2006; Elkington, 1999; Deegan and Gordon, 1993), and the self-laudatory nature with minimal disclosure of negative information (Deegan and Rankin, 1996; Deegan and Gordon, 1993). Research on CR in the forest industry is, however, heavily dominated by qualitatively-oriented studies, which are often based on a limited number of regional case companies. Some recent studies (e.g., Vidal and Kozak, 2008a, 2008b; Mikkilä and Toppinen, 2008) have raised doubts whether CR still remains part of business communication with the principal aim of improving corporate reputation and constrains rhetoric from reality.

While studies on corporate disclosure in the forest-based industries are scarce, the literature in general is abundant. Investigations on the relationship between the extent of corporate disclosure in annual reports and corporate characteristics have shown that companies may increase social or environmental disclosures in response to societal pressure (Hogner, 1982) and various corporate characteristics may influence the extent of the disclosures (e.g., Roberts, 1992; Patten, 1991, 1992; Cowen et al., 1987; Trotman and Bradley, 1981).

There are indications that size of the firm or the industry sector has influence on the scale and quality of corporate disclosure, and larger firms tend to have more extensive disclosure (e.g., Reverte 2009; Brammer and Pavelin, 2008; Branco and Rodrigues 2008; Cormier and Magnan, 2003; Hackston and Milne, 1996). Additionally, factors such as being listed on the stock market (e.g., da Silva Monteiro and Aibar-Guzmán, 2009), having a higher media exposure (Reverte, 2009; Branco and Rodrigues, 2008), perceived firm risk (volatility) and ownership (Cormier et al., 2005), among others, seem to be associated with the extent of CR disclosure.

In addition to that the larger firms disclose more information than smaller firms (see, for example, Purushothaman et al., 2000; Adams et al., 1998; Neu et al., 1998; Meek et al., 1995; Patten, 1991), larger firms are also significantly more adept at communicating their investment (Knox et al., 2005). Rowley et al. (2000) observe that firm size is associated with stakeholder

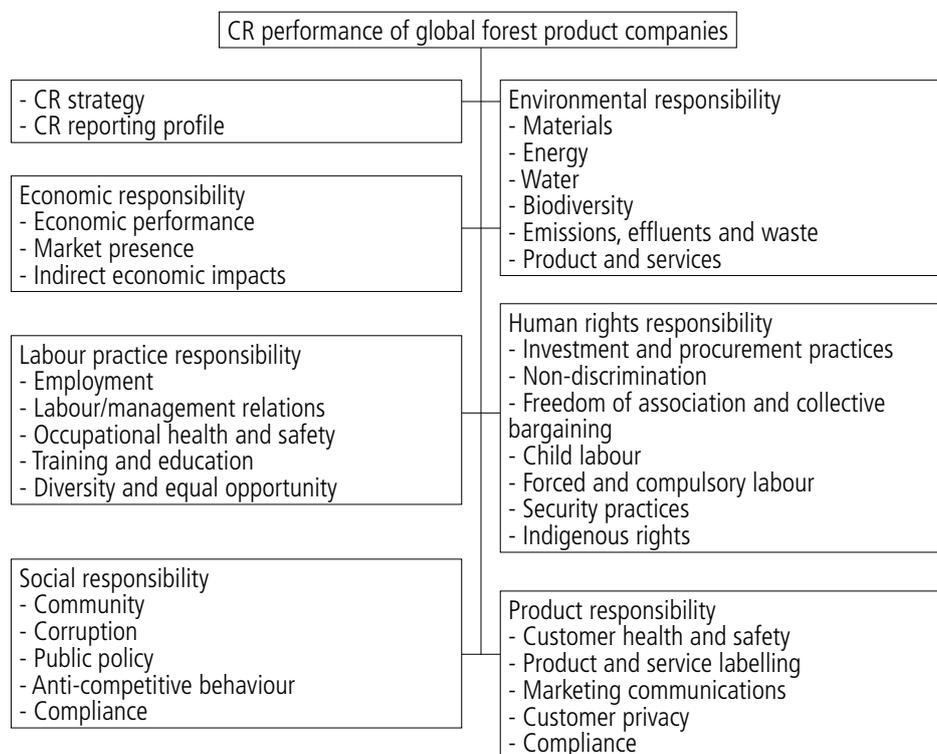


FIGURE 1 Operationalisation of the GRI framework (2006) for this study

actions, and market leaders in terms of revenues, market share, or total assets are more likely attacked by stakeholder action. In the line of thinking with the prior research discussed above, we expect that company size plays an influencing role in determining corporate disclosure.

Hypothesis 1: There is positive effect of company size on the sustainability disclosure in the forest industry.

Both good management theory and slack resource theory support the assumption that corporate social performance (CSP) is positively associated with financial performance (see, for example, Orlitzky et al., 2003; Waddock and Graves, 1997). Proponents of good management advert that high levels of CSP are indicators of superior management competence, which will lead to improved stakeholder relationships and better performance (Waddock and Graves, 1997; Freeman, 1984). Moreover, positive customer perceptions on the company (i.e., product nature and quality, environmental awareness, public relations, and community involvement (Prahalad and Hamel, 1994) have become important sources of competitive advantage (McGuire et al., 1990; McGuire et al., 1988). Proponents of slack resources persist in that higher financial performance would be an indicator of better CSP (McGuire et al. 1988; 1990). On the other hand, both behavioural theory and empirical studies on publicly traded companies suggest that slack resources have positive influence on financial performance (George, 2005), enabling the company to pursue desirable CSP.

A meta-analysis based on 66 studies by Daniel et al. (2004) supports the slack resource theory. By limiting their investigation to financial slack (e.g., liquidity) and performance (e.g., profitability), the authors found all the three types of slack resources (available, recoverable, and potential) are positively associated with financial performance. Therefore, we propose our second hypothesis as follows.

Hypothesis 2: There is a positive effect of profitability on sustainability disclosure.

However, it should be noted that, on the contrary, a number of recent studies did not find significant association between

corporate disclosure and firm profitability (e.g., da Silva Monteiro and Aibar-Guzmán, 2009; Reverte, 2009; Brammer and Pavelin 2008; Branco and Rodrigues, 2008; Cormier et al. 2003; Hackston and Milne, 1996).

Concern about CR has become a worldwide phenomenon, but the focus and extent of it varies regionally. There are indications that a variety of institutional factors, including governmental policies, national culture, the economic development, legal requirements, type of industry, and the level of processing technology, can influence corporate decision makers in different countries to pay more - or less - attention to particular CR related issues. A combination of these factors will likely determine to what extent CR strategies or practices are voluntary or mandatory. Recent literature suggests that, for example, North American companies typically adopt the neo-liberal approach to CR, which is prevalent in stimulate a relatively narrow approach to the efficiency-ethics trade-off, while in the continental Europe, corporate volunteering is often much less advanced, and more process oriented; participation and membership is more important than output (Meijs and Bridges Karr, 2004). As indicated by previous research, CR practices in Asia are not very well advanced and primarily aim at the improved efficiency and international competitiveness of the industry itself (van Tulder and van der Zwart, 2006), and relevant regulations have been primarily developed in environmental protection, which directly affects the internationalization strategies aimed at markets of developed countries. Moreover, Asian companies, being usually the case, exhibit an inactive orientation on labour and human rights and working conditions (van Tulder and van der Zwart, 2006). In Latin America, CR promotion and public advocacy is well established by a range of external agents through cooperation; thus CR is particularly associated with social commitment. The large contrast between the rich and the poor, and the discrimination against minorities in the labour market, leads to a number of specific priorities, including labour welfare and discrimination. The subject of health and safety in the work place also deserves a great of attention.

Accordingly, we expect that corporate attention, as expressed in the sustainability disclosure, varies across regions or continents. There are indications that the environmental reporting in Europe and North America could be expected to be higher than in other continents. On the other hand, we also expect that Latin American and African companies pay more attention to a number of priorities, such as discrimination, inequality, corruption, and democracy.

Hypothesis 3: Country of origin has an impact on corporate sustainability disclosure in the forest industry.

Industry characteristics can make the nature of corporation distinct based on different internal characteristics and external demands (Griffin and Mahon, 1997), and because the nature of stakeholder actions appears to be an important influence on CSP, different industries face different portfolios of stakeholders with different degrees of activity in different geographical areas (Rowley and Berman 2000; Griffin and Mahon, 1997). Companies within those environmentally sensitive industries were found to report more on environmental (see, for example, Roberts, 1992) and social responsibility (Clark and Gibson-Sweet, 1999; Adams et al., 1998; Patten, 1991) than their domestic and international counterparts.

Previous studies have also observed interesting and substantial differences in reporting practices by different industries (see e.g., Campbell et al. 2003; Cormier and Magnan, 2003; Roberts 1992; Harte and Owen 1991; Cowen et al., 1987; Dierkes and Preston, 1977). More specifically, Dierkes and Preston (1977) claimed that companies in industries where economic activities modify the environment, such as extractive industries, are more likely to disclose information about environmental impacts than are companies in other industries. Roberts (1992) contended that corporations with a high profile (e.g., with consumer visibility, high level of political risk, or concentrated intense competition) are more likely to disclose social and environmental responsibility activities than low profile industries. Based on the argument that consumers are one major conduit to affect corporate economic performance, industries closer in the value chain to final consumers would be more likely to face higher levels of stakeholder action, because stakeholders with interests tied to these industries tend to have greater incentive to take action, and important stakeholders such as mass media, government, non-governmental organizations, and class action layers would likely get attracted to enable broader stakeholder action. Consequently, we assume that the more diversified the company is, and with the possession of own forest resources, the greater the pressure from its stakeholders. Our third hypothesis is formulated as follows.

Hypothesis 4: Integrated forest industry companies will disclose more widely overall than the rest of the industry with narrower business focus.

Data and methodology

Content analysis is the primary tool used for analyzing the published CR disclosure. It is a "technique for the objective, systematic, and quantitative description of the manifest content of communication." (Berelson, 1952, p.18). Quantitative content analysis is reductionist, with sampling and operational or measurement procedures that reduce communication phenomena to manageable data (e.g. numbers), from which inferences may be drawn about the phenomena themselves (Krippendorff, 1980, p. 21). In our study, this is done by detecting the presence or absence of information covering a number of different subject areas in corporate disclosure. Information provided in the sus-

tainability reports/CR reports is thus assumed to reflect the CR activities adopted by the company (e.g., Rhee and Lee, 2003).

The initial samples used in this study included the top 100 forest industry companies listed by Pulp and Paper International (PPI), and the sustainability disclosure of 2006 or of the most corresponding years (2005 or 2007) were scrutinised. The reports could be either a separate sustainability or CR reports or, if not available, the annual report (also called 'integrated report') if it sufficiently contained information dealing with environmental, social responsibility and other sustainability issues. A final sample of 66 forest companies met the criteria of this study, including 44 CR reports or sustainability reports and 22 integrated annual reports. The corresponding figures of return on capital employed (ROCE), the financial performance indicator used in this study, were obtained from PricewaterhouseCooper's database (PWC, 2008).

This study was designed to utilize the extensive measures and occurrences of the GRI framework to evaluate the sustainability disclosure of the world's largest forest companies. A content analysis was first performed to outline the reporting profiles of the sample companies by detecting the presence or absence of items defined by the GRI framework. The content of the selected corporate reports were categorised to capture the six domains of the GRI framework, including economic, environmental, labour and employment, human rights, social, and product and service. In order to transform words of the reports into quantifiable data, original texts were first classified into analysable data language according to the classification framework under the GRI framework, ensuring that each indicator and their pertaining clauses are explained clearly and precisely. A total of 79 indicators were identified to measure the six dimensions of sustainability disclosure defined by the GRI framework.

Each item of disclosure pertaining to any of the categories is treated equally important in coding by being assigned a point. An item appearing more than once will not receive a second point. To ensure the coding accuracy and improved reliability and validity, a two-tier independent coding was performed, and in order to improve the coding reliability, results were cross-checked by both researchers so that the classification of the texts would correspond to the same standard. The final scores of each indicator are divided into a range of scales (1-5), where 1 means no information is disclosed and 5 stands for complete information is provided.

After the content analysis, linear regression modelling was performed to analyze the relationship between the sample companies' reporting profile and the determining factors discussed in the theoretical section. The same explanatory factors for concurrent year were used in all regression models. Instead of evaluating the overall reporting profiles of the company under the GRI reporting framework, for the sake of simplicity at this stage, we decided to concentrate on three disclosure dimensions: environmental, social, and product and service). In our regression modelling, these three dependent variables are based on summative variables, indicating the completeness of provided information within each category. Four independent variables were also identified, including total sales (measuring company size), (ROCE_2007 (measuring profitability), head quarter location, and business line.

Results

Descriptive analysis

Summative variable of environmental responsibility represents the set of most significantly emphasized indicators under the

GRI framework, followed by labour and employment responsibility, and economic responsibility, while human rights responsibility and social responsibility received the least attention from the sample companies, followed by product and service responsibility. Environmental responsibility still plays the dominant role in assessing CR performance, and its pertaining indicators represent a considerable proportion in the GRI guidelines. Table 1 depicts the divergence of sustainability reporting profiles between different groups. A T-test was used for the pair-wise comparison of means between the groups under the GRI reporting framework in this study.

A number of significant differences were observed between business line and the six summative variables. Integrated forest companies with the ownership of forest resources seemed to emphasize more economic-related and environmental-related issues than those companies which are within the paper and packaging category ($p = 0.021$, $p = 0.001$). In terms of labour and employment responsibility, integrated forest industry companies placed more comprehensive attention on the corresponding issues than those companies which are in the pulp and paper and packaging category ($p = 0.029$), as well as those companies within paper and packaging category ($p < 0.01$). No significant difference was found between groups under the summative variable of human rights. Integrated forest industry companies emphasized more social responsibility disclosure than those companies within pulp and paper and packaging category ($p = 0.031$) and paper and packaging category ($p = 0.021$). Similar differences were also observed under product and service responsibility, where integrated forest companies placed significant attention on the corresponding issues than those companies of pulp and paper and packaging category ($p = 0.013$), as well as those companies within paper and packaging category ($p = 0.009$).

This result suggests that the geographic location of the firm exhibit divergence in their sustainability disclosure: the few Latin American and African companies in the data seem to perform better than their international counterparts in all six reporting domains. However, no statistically significant difference between companies in terms of head quarter location were observed between economic, environmental, social, product and service responsibility, respectively, whereas significant differences were found under labour and employment responsibility, and responsibility for human rights.

In terms of labour and employment responsibility, Latin American companies and African companies seemed to emphasize most on labour- and employment-related issues, while Asian and Oceanian companies were identified to be least interested in

addressing the corresponding issues. In terms of human rights responsibility, North American companies were identified to pay most attention to human rights-related issues, whereas the corresponding issues were least emphasized by Latin American and African companies ($p = 0.049$).

Results from regression analysis

Table 2 presents the results of the regression analysis. As can be seen from it, the adjusted R²'s of the three regression models were in the range of 0.22 to 0.49, and being highest in the environmental disclosure model. Confirming Hypothesis 1 (H1), the size of the firm is positively related to the scale of both environmental and product and service disclosures, and this result is consistent with many previous studies. Country of origin or profitability was not found to be significant in any of the models, and therefore both the Hypothesis 3 (H3) and Hypothesis 2 (H2) were rejected. As for the importance of the business line dummy variables in explaining variation between companies' disclosure, dummy on paper + packaging vs. integrated was positive and significant in each model; on the other hand, confirming our Hypothesis 4 (H4). However, paper + packaging vs. pulp + paper + packaging dummy were significant only in the social disclosure model.

Conclusion and discussion

The results of our study mirror the overall patterns of sustainability disclosure in the global forest industry under the GRI reporting framework. Based on the values of summative disclosure domains in our data, environmental responsibility represents the most significantly emphasized area (measured by the average value of summative indicators) under the GRI framework, followed by labour and employment responsibility and economic responsibility. Human rights and social responsibility seem to receive the least attention in the 66 largest forest industry companies, followed by product and service responsibility. Our results support the findings of previous research (e.g., Vidal and Kozak, 2008a, 2008b; Mikkilä and Toppinen, 2008), which suggest that corporate disclosure on social responsibility issues deserves more attention from the companies and should be developed towards more comprehensive metrics in the forest sector. On the other hand, no significant regional difference (measured by headquarter location) was found in terms of sustainability disclosure with the exception of labour and employment responsibility and responsibility for human rights.

The results we obtained from the regression analyses indicate

TABLE 1 Pair-wise comparison of means between groups and sustainability reporting profiles

	Economic	Environmental	Labour & Employment	Human Rights	Social	Product & Service
Business Line						
Integrated (n=24)	17.00 (5.53)*	17.00 (5.53)*	27.08 (8.30)**	11.71(4.90)	11.71(4.90)	14.17 (8.20)*
Pulp + Paper +Packaging (n=12)	14.08 (3.26)	14.08 (3.26)	20.75 (5.29)	9.50 (1.24)	9.50 (1.24)	8.25 (0.45)
Paper + Packaging (n=30)	14.89 (4.80)	14.89 (4.80)	19.27 (6.00)	9.87 (3.06)	9.87 (3.06)	9.37 (4.17)
HQ Location						
Europe (n=15)	15.47 (5.95)	61.40 (25.24)	25.27 (7.41)	10.27 (2.28)	10.27 (5.66)	10.40 (4.14)
North America (n=23)	14.61 (5.57)	56.04 (19.95)	20.30 (8.02)	9.48 (1.53)	10.04 (5.73)	11.17 (7.02)
Asia + Oceania (n=18)	13.50 (2.64)	55.28 (21.76)	19.94 (5.58)	10.44 (3.88)	8.89 (2.35)	9.50 (4.19)
Latin America+Africa (n=10)	17.20 (3.50)	66.60 (15.62)	27.20 (7.52)	13.10 (6.89)	12.60 (5.17)	13.60 (8.97)

^aThe figures in the table are mean values with standard deviations in parentheses

* T-test significant at the 0.01 level, **Significant at the 0.05 level

TABLE 2 Results of the regression models for environmental, social, and product and service disclosure under the GRI reporting framework

Independent variables	Environmental	Social	Product & Service
(Constant)	36.068 (6.074) ^a	9.433 (5.389)	7.083 (3.652)
Total sales in \$ million	0.003 (5.31)*	0.000 (1.595)	0.001 (3.298)*
ROCE_2007	2.117 (0.035)	-29.537 (-1.64)	-6.448 (-0.323)
North America vs. Europe	1.305 (0.216)	-0.725 (-0.407)	-2.167 (-1.097)
North America vs. Asia + Oceania	-0.419 (-0.071)	-0.935 (-0.536)	0.507 (0.262)
North America vs. Latin America + Africa	12.251 (1.625)	1.78 (0.801)	0.473 (0.192)
Paper + Packaging vs. Integrated	13.531 (2.282)*	4.339 (2.483)*	4.869 (2.515)**
Paper + Packaging vs. Pulp + Paper + Packaging	13.499 (2.061)*	-0.321(-0.166)	0.633 (0.296)
	R ² = 0.562; Adj. R ² = 0.493; F = 8.232*; P < 0.01	R ² = 0.328; Adj. R ² = 0.223; F = 3.135*; P = 0.009	R ² = 0.406; Adj. R ² = 0.314; F = 4.393*; P = 0.001

^a The figures in the table are regression coefficients with t values in parentheses

*Significant at the 0.10 level, **Significant at the 0.05 level

that, forest industry companies seem to be sensitive to media exposure (as proxied by their size) but are insensitive to profitability (as measured by ROCE) when determining their CR strategies and there are no regional differences between the disclosure determinants. Our findings are in line with prior literature (e.g., Reverte 2009; Brammer and Pavelin, 2008; Branco and Rodrigues 2008; Hacston and Milne, 1996) that company size or industry sector has positive influence on the scale and quality of the disclosure. A recent study on French companies' environmental practices by Cormier and Magnan (2003) observes that, as a result of strong impact of globalised stock market on fostering convergence in corporate practices, companies have increasingly realized the importance of sustainability disclosure and thus adopted corresponding disclosure strategies in responding to the growing demands from their stakeholders.

There are obvious limitations in our study, which provide opportunities for future research. First, a note of caution is warranted in a study such as this that relies on published sustainability disclosure by companies. There might be companies that have CR programs, but have not disclosed, or have used their websites or other channel to disclose such programs. Our research does not capture this information. As mentioned in the chapter Data and methodology, the quantitative content analysis in our study is done by detecting the presence or absence of information covering a number of different subject areas in the sustainability disclosure, and information provided in the corresponding reports is thus assumed to reflect the CR practices adopted by the company. It should be recognized, however, that the key measure used in our content analysis (or even to a broader extent of content analysis on corporate disclosure in general) is communication of economic, environmental and social performance, not CR performance per se, and that the lack of reporting may not necessarily indicate a lack of CR action in reality. Frequently asked questions such as are companies really doing everything they are reporting? Or is CR reporting only a part of the corporate green-washing agenda or merely a tool for public relation? could only be really answered through independent audits of CR performance. However, based on the analysis done we conclude that (large) forest companies are trying to make progress in their reporting and are heeding stakeholder calls for greater business sustainability.

Second, a generic limitation of this form of content analysis

is, according to Zéghal and Ahmed (1990), that it does not enable the researcher to fully measure the extent of information disclosed and the emphasis attached to each item by the company. On the other hand, the use of GRI framework in this study provides a wide coverage of sustainability aspects, and its extensive measures and occurrences could, to certain extent, counter-balance the deficiency of this form of content analysis.

Third, we strictly followed the GRI reporting framework when measuring the sustainability disclosure profiles of the sample companies, and thereby only detected the presence or absence of items defined by the GRI reporting guidelines. Using some other guidelines or frameworks, such as UNGC, AA1000, SA8000, ACCA, or Balanced Scorecard, different dimensions and disaggregation of sustainability could be expected. Nevertheless, as already mentioned, our empirical findings in terms of the effect of company size and regional differences on sustainability disclosure are also in line with the previous literature that did not use the GRI measures.

Fourth, it should be noticed that the results from our regression modelling are only preliminary, because the set of explanatory variables measuring industry and firm characteristics was limited to company size, geographic location, business line, and financial performance. In the future studies, more profound analyses should be carried out, for example, to analyse the impacts of demand conditions and consumer proximity on the sustainability disclosure in the forest industry. Due to the fact that only three disclosure dimensions (environmental, social, and product and service disclosure) were analysed, future research should consider taking the dimensions of labour and employment, and human rights into account. In addition, a wide range of indicators in terms of (both internal and external) corporate characteristics and financial performance indicators should be applied to better determine factors in CR decision-making. Given the limitation of such a single industry study, it would be worth of ascertaining whether similar patterns exist in other industries, including companies within extractive industries (e.g., oil and gas, chemical, mining) and those with less dependence on natural resources (e.g., service industry).

Accompanying the accelerated pace of sustainability, CR-related practices are becoming normalized worldwide, supplemental and voluntary disclosures are one effective way through which companies cope with often adverse stakeholder demands

(Toppinen et al., 2010). Therefore, a call for specific supplements (e.g., under the GRI framework) to address the unique needs of the forestry sector and those industries or sectors yet without specific supplements becomes much obvious and urgent in CR agenda. Future research is also needed to explore best practices and industry-specific factors toward successful CR and sustainable development. The findings from our study could also be supplemented by qualitative studies (e.g., interviews with senior executives or the CR specialists of the companies) or by an industry survey, in order to glean a more thorough understanding of particular cases and common factors. For example, relevant questions include what particular issues or themes forest-based companies encounter, what CR-related systems or standards are adopted by the companies in dealing with CR issues, why such systems or standards are favored in the companies, and how such systems or standards are implemented and evaluated. Previous literature on CR has basically focused on large companies with a primary thrust to explain the institutionalization of formal policies and the manner in which CR is incorporated into decision making and work practices. CR is still perceived as a fuzzy concept to those of SMEs in general, who are often

lacking in an explicit definition or execution of CR, as well as the potential benefits incorporated. While prior CR research in the forestry context has largely focused on the major forest and paper companies, CR of SMEs within the forest industry has not yet been studied (with the exception of Li et al., 2010). Case studies are thus important and needed to understand managerial perceptions on CR and to explore best practices that attract SMEs' involvement. Furthermore, since SME approaches to CR are particularly endogenous, derived from various societal expectations for business and routes to sustainability, a variety of contexts, such as cultural differences and values, (local) stakeholder structure, stage of economic development and strategic cognition of individual managers should all be taken into account for desirable outcome.

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