THE ACCOUNTING REVIEW
Vol. 84, No. 3
2009
pp. 937–967

American Accounting Association
DOI: 10.2308/accr.2009.84.3.937

Assurance on Sustainability Reports: An International Comparison

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ABSTRACT: Globally, companies increasingly publish separate general purpose, non-financial (sustainability) reports. Some of these are independently assured and assurers may or may not be from the auditing profession. We seek to understand this emerging voluntary assurance market. Using a sample of 2,113 companies (from 31 countries) that produced sustainability reports between 2002–2004, we use sequential logit analysis to identify the factors associated with the decision to voluntarily purchase assurance and the choice of assurance provider. We hypothesize that a company's need to enhance credibility through assurance and choice of assurance provider will be a function of company-, industry-, and country-related factors. Our results support the argument that companies seeking to enhance the credibility of their reports and build their corporate reputation are more likely to have their sustainability reports assured, although it does not matter whether the assurance provider comes from the auditing profession. We also find that companies operating in stakeholder-orientated countries are more likely to choose the auditing profession as an assurer.

Keywords: *voluntary assurance; sustainability reports; choice of assurer; assurance services.*

Data Availability: *All data are publicly available.*

The authors thank the participants of the 2007 Midyear Auditing Meeting of the American Accounting Association, the 2007 International Symposium on Audit Research, and seminars at Bentley College and Northeastern University, along with Martin Carree, Rogier Deumes, and Thomas Thijssens for their helpful comments. The authors appreciate the financial support of the Australian Research Council and CPA Australia. The research assistance of Anna Kuo, Anna Huggins, Linda Pellegrino, and Per Tronnes is also much appreciated.

Editor's note: Accepted by Steven Kachelmeier, with thanks to Bill Kinney for serving as editor on a previous version.

Submitted: October 2007
Accepted: October 2008
Published Online: May 2009

I. INTRODUCTION

The last five years may come to be regarded by social historians as the watershed period in the development of a global consciousness about the reality and effects of climate change. The publication of the *Stern Review* (Stern 2007), the work of the UN Intergovernmental Panel on Climate Change (IPCC 2007), and progress in the development of emissions trading schemes in Europe and elsewhere have all combined to focus community and government attention on the need to pursue a sustainable mode of capitalism. Since the Brundtland Report (1987), the catchcry of ''sustainable'' business has been associated with many and varied initiatives—from pressure exerted by lobby groups for environmentally friendly disposal of unused assets, to corporations banning the use of child labor in supply chains and the current emphasis on the reduction of carbon emissions.

Within the accounting arena, the sustainability agenda has been linked to early concepts such as social audits and human resource accounting in the 1970s, to intellectual capital, environmental and triple bottom line reporting in the 1990s, and to recent versions of the Global Reporting Initiative (2007). While corporate support for these different accounting /reporting initiatives has varied over time, there has been a consistent concern that traditional financial reports do not adequately represent the multiple dimensions of corporate value today. This has resulted in a search for new financial metrics (see Rappaport 1998; Stewart 1999), and/or additional nonfinancial measures of value/performance (see Kaplan and Norton 1992; Sveiby 1997). Associated with these developments has been a growing tendency for companies to issue general-purpose, stand-alone nonfinancial reports (hereafter, sustainability reports). Some of these reports are independently assured, and the assurer may or may not be a member of the auditing profession. The primary purpose of this study is to better understand this emerging assurance market and, in particular, the role of assurance in establishing corporate credibility. We also seek to inform the international assurance standard-setting process.[1]

The sustainability reports analyzed here are the nonfinancial equivalent to general-purpose financial reports, and are intended to meet the information needs of the general public. Given the primary purpose of this study, there are two major categories of nonfinancial information that are excluded. The first are special purpose reports that are not intended for public consumption, and are therefore of less public interest because they are used primarily for internal decision making or to meet a reporting requirement of a specific regulatory body. The second category of nonfinancial information excluded is nonfinancial information disclosed in annual reports. While companies have been reporting this information in both the annual financial reports to shareholders and in separate voluntary reports (Kolk 2003; Ballou et al. 2006), this study concentrates on the separate (stand-alone) voluntary reports because its main focus is to examine the assurance of this information. The decision to disclose nonfinancial information in an annual report clouds the assurance decision. For the period of analysis, no instance was identified of a separate assurance report for sustainability information contained in an annual report, which could cause confusion as a result of including two assurance reports in the same document.

While there may be certain requirements to disclose nonfinancial information to certain groups (such as specific regulators), around the world, no regulation can be identified that requires this information to be disclosed in the form of a stand-alone report for the general

[1] One of the authors of this paper is the Chair of the Sustainability Expert Advisory Panel, which is responsible for informing the International Auditing and Assurance Standards Board (IAASB) and helping develop assurance standards or guidance in the area of assurance for sustainability reporting.

public. As a result, there is no regulation requiring that the information in this report be assured. Thus, this study examines a true voluntary assurance decision.

A useful way of categorizing the nonfinancial information contained in these sustainability reports is by reference to the six categories of nonfinancial indicators contained in the Global Reporting Initiative (GRI) 2007[2] categorization scheme: economic, environment, labor, human rights, product responsibility, and society. The reports examined for this study range from comprehensively reporting on a single dimension outlined above (such as environmental activities/performance) to reporting on all six dimensions. Variation in the content of the sustainability reports is an issue that may impact on the assurance function, and this study will consider its possible impact. Given that the purchase of assurance is a costly decision, it may be assumed that companies purchase such assurance because the benefits outweigh the costs. Benefits could include increased stakeholder or user confidence in the quality of the sustainability information provided and/or increased stakeholder trust in the level of organizational commitment to sustainability agendas.

In order to better understand this emergent assurance market, we provide background information on the factors associated with the decision to produce sustainability reports. We do not develop and test hypotheses on these factors as the aims of this paper are to analyze and better understand the decision to assure and the choice of assurance provider. In pursuit of these aims, we formally test the factors associated with the organizational decision to assure, and, for those companies that do assure, the factors associated with the choice of assurance provider. We expect that there are company, industry, and country characteristics that will create a greater need to improve the credibility of sustainability information, and therefore influence the decision to assure as well as the choice of assurance provider. The justification for concentrating our formal analysis on those companies that produce sustainability reports is that it is only these organizations that have to decide whether to assure, and only if they decide to assure do they then have to make a decision as to the type of assurance provider.

We argue that assurance is related to a desire to improve the credibility of the disclosed information. In line with the stated aims of the research and extending recent international comparison research (for example, Choi and Wong 2007), we identify characteristics of industries and countries that are expected to result in a greater need for companies to demonstrate that the information they produce is credible.[3] They are therefore more likely to have this information assured and, if so, choose a higher quality assurance provider. For evaluating the role of assurance and choice of assurance provider in the international market, this voluntary setting is therefore more suitable than a regulated financial statement setting.

In brief, our results show the following. For the period 2002–2004, based on 40,993 companies for which we had the required financial data, we found that 2,113 produced sustainability reports for which we were able to gather other required information. Japan (527 companies), the U.K. (385 companies) and the U.S. (339 companies) are the three most heavily represented countries. In total, 655 of these 2,113 (31 percent) public reports are assured, and members of the auditing profession assure 275 (42 percent) of these. Our

[2] This is widely regarded as the most dominant set of global reporting regulations for sustainability reporting: ''the number of companies around the world adopting GRI standards and issuing corporate sustainability reports, along with the fact that the GRI works closely with the United Nations, gives its reporting criteria the credibility necessary to be considered generally accepted'' (Ballou et al. 2006, 66).

[3] The company variables included represent dimensions that have been commonly found to be related to voluntary disclosure and assurance decisions: size, leverage, and profitability (for example, Chow 1982; Hibbit 2003; Cormier et al. 2005). These are therefore included as control variables in the later analyses.

multivariate results demonstrate a strong link between companies with a higher need to enhance credibility and those having their sustainability reports assured. With regard to the choice of assurance provider, we find that companies domiciled in more stakeholder-orientated countries are more likely to choose a member of the auditing profession. The factors associated with a greater need to add credibility appear to be more closely related to the decision to have the information assured than they are with the choice of assurance provider.

In the next section, we provide a literature review on the demand for voluntary assurance. Subsequently, we develop our hypotheses, followed by a description of our data and empirical models. Finally, we present the results and conclude.

II. LITERATURE REVIEW ON VOLUNTARY ASSURANCE

The companies in this study have voluntarily produced a sustainability report, and have complete discretion as to whether this information is assured. Companies voluntarily produce such reports for a variety of reasons—including informing stakeholders—and thereby reduce the information asymmetry between the company and the market/public. Reporting also attests to organizational commitment, risk management, and a desire to build corporate reputation. In all these cases, the effectiveness of achieving these desired outcomes hinges on the perceived and actual credibility of the information provided. Assurance plays an important role in this. This section examines the findings in the literature on the market demand for assurance, the value obtained by employing assurance, and the incremental value associated with ''high-quality'' assurance.

Demand for, and Value of, Voluntary Assurance

Only a small number of empirical studies have examined the demand drivers for the voluntary adoption of assurance. Largely this is because the assurance of financial reports has been mandated by law for the better part of the twentieth century in most developed market economies, and research has focused on issues associated with this context. Chow (1982) was one of the first major studies to examine voluntary assurance. He investigated this issue from the agency theory perspective, arguing that agency costs are associated with the voluntary adoption of financial statement audits. His study focused on the year 1926, that is, prior to the introduction in the U.S. of a legal mandate for assurance on historical financial information. He documents that proxies for agency costs associated with both shareholders and creditors, such as leverage, the extent to which accounting numbers are used in debt covenants, and company size are positively associated with the voluntary adoption of financial statement audits.

Abdel-khalik (1993) adopts a different perspective and views the demand for assurance as an effective within-company control mechanism to compensate for the loss of control induced by organizational design and the resultant loss of observability of subordinate behavior. He argues that this loss of internal control may potentially give rise to moral hazard problems and an increasing likelihood of distorted communication. Consistent with the ''organizational design'' hypothesis, his results indicate that larger companies are more likely to voluntarily demand assurance.

The association between assurance and control is approached from a related but different angle by Blackwell et al. (1998), who argue that the demand for assurance stems from the need to mitigate information asymmetry with institutional creditors. Blackwell et al. (1998) find assurance to be perceived by institutional creditors as an effective means of control. Similarly, Carey et al. (2000) examine family businesses in Australia and find that the voluntary demand for assurance is associated with information asymmetry and loss of

control, such that the proportion of non-family managers and non-family directors is positively associated with the demand for external assurance. Consistent with Chow (1982), Carey et al. (2000) find that the demand for assurance is also associated with higher levels of debt.

The above discussion indicates that assurance serves as a useful control mechanism to enhance the credibility of disclosed information and facilitate greater user confidence. Hence, it should result in more appropriate resource allocation decisions by information users.

Demand for "High-Quality" Assurance

In most studies to date, differences in the quality of assurance services provided have been studied by examining differences between the use of Big N firms and non-Big N firms. It is argued that the Big N audit firms possess scale economies and greater capacity to invest in new technologies. They also have a greater investment in maintaining their reputational capital. Taken together these factors suggest that the Big N firms are less likely to behave opportunistically or myopically. As a result, they are better able to serve as an effective monitoring mechanism than are smaller auditors (DeAngelo 1981; Watts and Zimmerman 1986). Moreover, due to their size, the Big N audit firms are less prone to fall victim to fee dependence, as the costs of compromising independence (litigation and reputation costs) outweigh the benefits (Craswell et al. 2002).

Examining the quality issue by comparing differences between the Big N and non-Big N audit firms is sensible within a context in which the law provides monopolistic rights to these firms to conduct the audit of financial statements. Such a state-guaranteed monopoly does not exist in the area of assurance on sustainability reports, and assurance in this unregulated market may also be purchased from other providers such as environmental management firms. It is into markets such as this that visionaries such as Robert Elliott saw the accounting profession expanding its skills as information and assurance (attest) professionals (Elliott and Jacobson 2002). We therefore distinguish between assurance providers who are members of the auditing profession and other assurance providers. Similar to the arguments for the Big N versus non-Big N outlined above, we classify members of the auditing profession as the higher quality assurance providers. The auditing profession has well-developed ''global'' standards, a body of ethics and independence requirements, as well as quality control mechanisms at both the firm and engagement levels that help ensure that the assurance provided is of a consistently high quality. In areas requiring specific subject matter expertise, which is commonly the case with assurance engagements on sustainability reports, there are specific standards in place to ensure that the engagement is not accepted if the engagement team does not have the required expertise, and procedures to be followed when using the work of experts. It is also a profession with an established history and reputational capital that is well known to communities. These factors help increase public confidence in the competency and legitimacy of the auditing profession as high-quality assurance providers. However, there is usually an increased cost associated with having assurance provided by members of the profession as opposed to other providers,[4] and as such the client chooses which assurance provider to use on a cost versus benefit basis.

[4] While this is difficult to show systematically as the fees for the engagements are not disclosed, discussions with assurance providers in this area in at least three countries suggest the fees charged by audit firms can be commonly up to five times the fees quoted by environmental consultants for the same engagements.

The Provision and Assurance of Sustainability Reports

Very little is currently known about assurance on sustainability reports, with the exception of some descriptive research surveys that have been undertaken. The most comprehensive of these is KPMG (1999, 2002, 2005), which examines whether the Top 100 companies in a number of different countries produce publicly available sustainability reports, and whether these are assured. A comparison of these three KPMG surveys suggests that the frequency of these types of reports is increasing, at least among the larger companies, and the reports are more commonly assured. Interestingly, there is noticeable between-country variation in both the provision and assurance of sustainability reports. They also indicate that the U.S. was one of a small handful of countries where the number of Top 100 companies issuing sustainability reports decreased between 2002–2005 (32 percent in 2005, down from 36 percent in 2002). In Canada, by contrast, there was a significant increase in the number of Top 100 companies producing such reports (41 percent in 2005 compared with 19 percent in 2002). The KPMG report for 2005 notes that the U.S. and Canada both have an exceptionally low proportion of their sustainability reports assured: U.S.: 3 percent and Canada: 10 percent; relative to U.K.: 53 percent, Australia: 43 percent, continental Europe: 41 percent, and Japan: 31 percent. This low rate in the U.S. may be partly a result of the U.S. attestation standards restricting the auditing profession from providing assurance on these reports (mainly because of concerns about lack of suitable criteria), although this explanation does not account for the inability of other types of assurance providers to fill the void in the U.S. Given that other assurance providers exist, it remains unclear why assurance rates are lower in North America.

The presence of cross-country variation is further supported by a study sponsored by CPA Australia (2004), which identified and categorized 161 assurance reports on general-purpose sustainability reports. That study shows a marked variation over geographic regions with respect to who provides assurance on these reports. In the four major regions classified in the CPA Australia study, audit firms provided assurance on 87 percent of reports in Japan, 60 percent in continental Europe, 23 percent in the U.K., and 15 percent in Australia.

This brief review has highlighted that there is relatively little research on the voluntary purchase of assurance for sustainability reports. Nevertheless, this is an interesting subject matter on which to explore the reasons for the observed patterns in this global assurance market, both with regard to the reasons associated with having this subject matter assured and the choice of assurance provider.

III. DEVELOPMENT OF HYPOTHESES

This study explores why companies producing sustainability reports have this information voluntarily assured and their choice of assurance provider. As independent assurance is a costly process, we expect that the companies that have these reports assured will be those for which the net benefits are greater.[5] As the literature review suggests, assurance confers several benefits. It helps to reduce agency costs[6] and confers greater user confidence in the accuracy and validity of the information provided.

We focus particularly on country-specific and industry factors that influence the benefits companies gain from purchasing assurance. In the international accounting and finance

[5] As the costs of these assurance services are not disclosed, the analysis concentrates on the characteristics of companies that are expected to gain greater benefit from such services.

[6] Studies (see Chow 1982; Abdel-khalik 1993; Blackwell et al. 1998; Carey et al. 2000) find that higher agency costs reflected by size and leverage are positively associated with the voluntary demand for audit. Hence, we include these factors as control variables in the models that we estimate.

literature, there is growing evidence of the importance of the national legal environment in explaining financial market development, corporate ownership structures, corporate policies, and the properties of accounting information in different countries/jurisdictions (Choi and Wong 2007). In this respect, Francis et al. (2006) provide evidence that governance structures are to some extent endogenous to broader country-level institutions and that company-specific incentives do not entirely explain variation in governance structures.

More specifically, we examine whether the organizational benefits resulting from assurance are a function of the legal environment of the country of domicile and the industry to which the company belongs. Why these two variables? Recent literature has shown that companies ''adapt to poor legal environments to establish efficient governance practices'' (Durnev and Kim 2005) and that ''Big Five auditors fulfill a strong governance function in weak legal environments'' (Choi and Wong 2007). Extending this argument from the financial audit research, we expect that companies operating in a weaker legal environment will be more likely to purchase assurance to increase user confidence in the credibility of the information contained in their sustainability reports. The demand for assurance is expected to be lower in countries with stronger legal environments because there are more country-level protection mechanisms in place in these environments (Choi and Wong 2007). This is supported by other studies that have found that firm-level governance characteristics are more pronounced in weak legal environments (for example, Klapper and Love 2004; Lang et al. 2004).[7]

Further, prior research has shown that there is an industry association between the level of environmental and social risks experienced by companies and the level of environmental and social disclosure (e.g., Adams et al. 1998; Patten 2002). Hence, we expect that companies belonging to industries having a greater environmental or social impact are more exposed to environmental or social risks and will have a greater need to manage these risks by purchasing assurance to increase user confidence in the credibility of the information contained in the sustainability reports they produce.

In examining choice of assurance provider we draw a distinction between companies that choose assurance from outside the auditing profession (e.g., environmental consultants), and companies that choose assurance from the auditing profession. We classify members of the auditing profession as the high-quality assurance providers (see DeAngelo 1981; Watts and Zimmerman 1986). This classification is supported by the fact that the auditing profession has in place well-developed ''global'' standards, independence and ethical requirements, and quality control mechanisms to help ensure the quality of any assurance reports that are issued by their members. The argument is further supported by the fact that firms (especially the major firms) within the profession also bring a high level of reputation capital to their engagements. A counter-argument is that specialist providers that are not members of the auditing profession (such as environmental consultancies) may possess a higher level of subject-matter expertise. However, such specialized expertise can always be (and nowadays commonly is) bought or employed by audit firms. Further, price could be an indication of quality in well-informed markets and, as outlined earlier, members of the auditing profession are believed to charge higher prices for the assurance of sustainability reports than assurance providers who are not members of the auditing profession.

[7] It is recognized that there is the alternative view, that in weak legal environments where the processes in place do not support and discipline auditors, they may be seen to compromise their audit quality, which may decrease the perceived benefits and therefore the demand for this service (Choi and Wong 2007). Consistent with this argument, Francis and Wang (2008) find that Big 4 auditors provide a lower level of audit quality (measured using proxies for earnings quality) in countries with a weaker institutional environment and a lower risk of litigation.

Given the above arguments and the absence of contradictory data, we hypothesize that members of the auditing profession are the higher quality provider.

Formally, our hypotheses are as follows:

H1a: Companies with a greater need to increase user confidence in the credibility of sustainability reports will be more likely to have their sustainability reports assured.

H1b: Companies with a greater need to increase user confidence in the credibility of their sustainability reports will be more likely to choose assurance from the auditing profession.

Aside from the need to increase user confidence, we argue that the business culture of a country, and in particular whether a country is more stakeholder- or shareholder-orientated, can influence the demand for assurance on sustainability reports and the choice of assurance provider. A stakeholder-orientated or communitarian culture is one in which a broad spectrum of stakeholders are seen by society as possessing a legitimate interest in corporate activities. Stakeholder groups in these countries will therefore have considerable influence upon the activities of companies. By contrast, a shareholder-orientated or contractarian business culture is one in which companies are primarily seen as instruments for the creation of shareholder value; other stakeholder groups have less legitimacy and therefore less influence on corporate activities (see Bradley et al. 1999). Given this distinction, we agree with the view that ''management in communitarian-orientated societies would be more likely to perform and disclose social responsibility activities as part of strategically managing stakeholder relationships'' (Smith et al. 2005). In line with this argument, Holder-Webb et al. (2008) suggest that U.S. companies lag behind international companies with respect to social responsibility reporting as they operate in a cultural environment that has a greater shareholder orientation. By extension, we expect that the demand for assurance and the choice of the auditing profession as assurance provider is higher in stakeholder-orientated countries compared to shareholder-orientated countries. This is reflected in the following two hypotheses:

H2a: Companies domiciled in countries that are more stakeholder-orientated are more likely to demand assurance on sustainability reports compared with companies domiciled in countries that are more shareholder-orientated.

H2b: Companies domiciled in countries that are more stakeholder-orientated are more likely to choose assurance from the auditing profession compared with companies domiciled in countries that are more shareholder-orientated.

IV. DATA

Our research attempted to identify as many sustainability reports as possible that were published covering the period 2002–2004. The major part of the data collection was over 2005 and 2006, and 2004 was the latest complete year of observations at that time. The major source of these reports was Corporate Register (http://www.corporateregister.com), which is a comprehensive directory of published corporate environmental and social reports. This source was supplemented by the Global Reporting Initiative database (http://www.globalreporting.org)[8] and the companies on the Dow Jones Sustainability Index (Dow

[8] At the time of initial search the GRI maintained its own database. The maintenance of this was later taken over by Corporate Register.

Jones 2007), other databases, and general searches. In total, we identified 2,662 general sustainability reports issued over the period 2002–2004.

In order to obtain the required financial information we used the Global Compustat database that contained 64,256 observations (of which 40,287 had the complete financial information) for the 31 countries identified as having companies producing sustainability reports over the three years. We then attempted to match each of the 2,662 general sustainability reports with a complete observation from Global Compustat, and were able to gain the necessary additional information for 1,407 of the 2,662 observations. For those observations with missing data we then searched the DataStream database and company websites, and were able to obtain the required information for a further 706 company observations, resulting in 40,993 complete company observations for the purposes of providing background information on the reporting decision, and a final sample of 2,113 observations for 867 listed companies over the three years for which we had all the necessary data for testing the hypotheses. Of the 2,113 sustainability reports, 655 (31.00 percent) contained independent assurance reports. We identified that the assurance provider was a member of the auditing profession in 275 (41.98 percent) cases.

V. RESEARCH MODEL

Our hypotheses are tested using a sequential logit model. This model serves the sequential notion of the decisions that are taken as this model is defined as a sequence of independent binary logit models. The sequential logit model estimates the effect of explanatory variables on the probabilities of passing a set of transitions.[9] First, for those companies producing a sustainability report, deciding whether to have this information assured. Second, for those companies deciding to have this information assured, whether to choose an assurance provider from the profession. In addition to these two decisions, there is the prior decision to produce a sustainability report. For completeness sake, these three decisions and the number of observations under each branch are illustrated in the decision tree presented in Figure 1.

The model tested is as follows:

$$ASSURANCE/PROVIDER = \text{f}(LEGAL,\ INDUSTRY,\ STAKEHOLDER,\ CONTROL\ VARIABLES). \quad (1)$$

In the first step of the sequential logit analyses, *ASSURANCE* takes the value of 0 in the case of the sustainability report not being assured, and 1 where the report is assured. In the second step, which only includes that subset of observations with assured sustainability reports, *PROVIDER* takes the value of 0 where the assurance provider does not belong to the auditing profession, and 1 in the case of assurance provided by a member of the auditing profession.

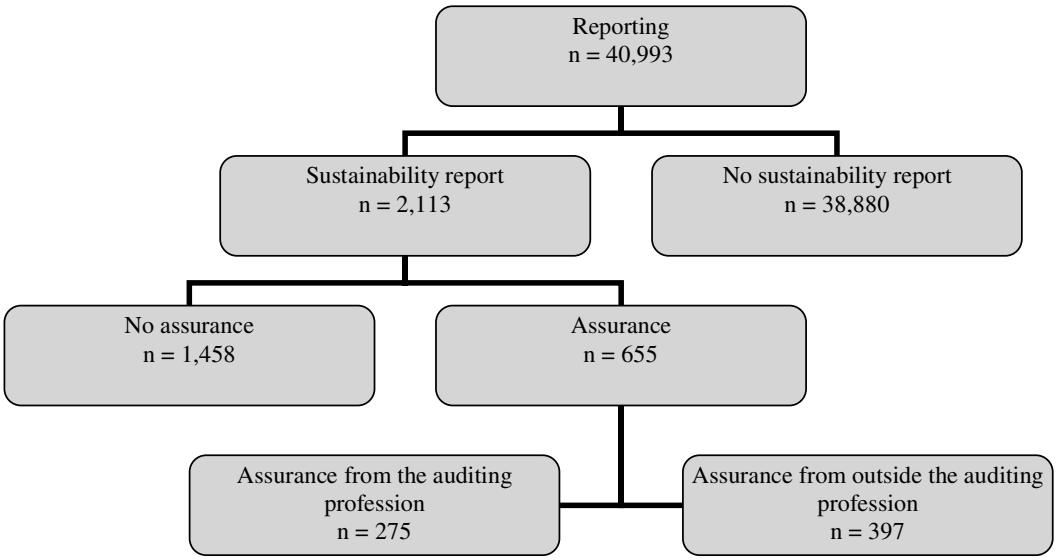
LEGAL represents the quality of the legal environment and is measured using the ''rule of law'' measure developed by the World Bank (Kaufmann et al. 2007).[10] The ''Rule of Law'' score measures the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence.

[9] For further technical details, refer to Akiva and Lerman (1985), Liao (1994), and van Ophem and Schram (1997). We estimated the sequential logit model with the ''seqlogit'' module in STATA. We also re-ran the analyses with separate logistic regression analyses that gave the same results.

[10] We use this measure rather than the La Porta et al. (1998) measures used by Durnev and Kim (2005) and Doidge et al. (2007) as this provides a relevant unique measure for each of the years 2002–2004.

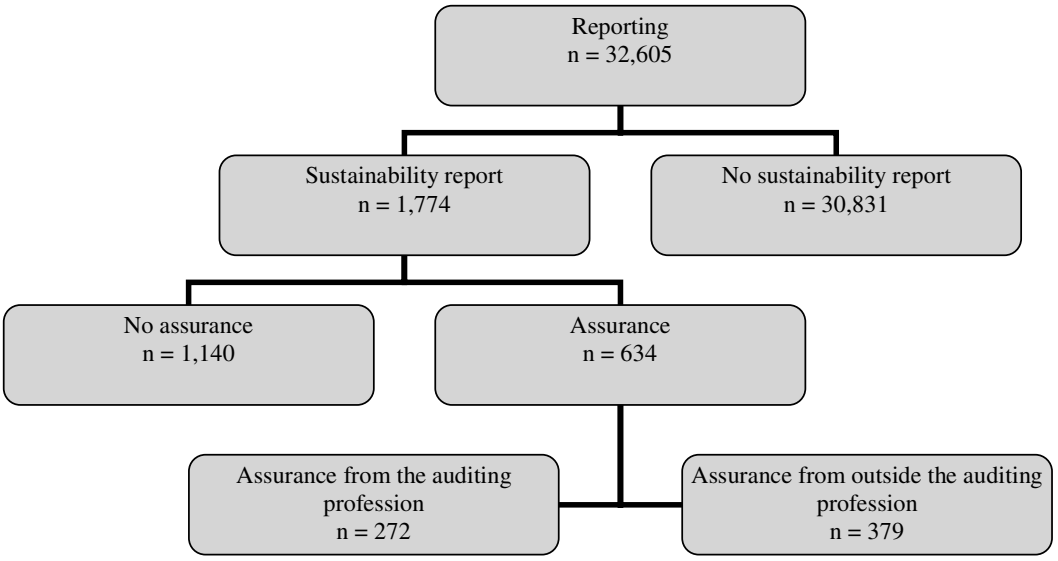
FIGURE 1
Decision Tree

Number of Observations for Sequential Logit Analysis



Seventeen assurance engagements involved assurers from both within and outside the auditing profession.

Sample Excluding the U.S.



The industry categories used are mining, production, utilities, finance, and other, on the basis of a firm's Global Industry Classification Standard (GICS) code and their main re-

ported operating activities. We consider the mining, production, utilities, and finance industries to be more exposed to environmental and social risks and therefore firms in these industries possess a greater need to increase user confidence in the credibility of their reported activities. *MINING* companies extract non-renewable resources with major environmental consequences, while *UTILITIES* produce the largest amounts of greenhouse gas emissions and are exposed to community concerns about climate change. Further, the *PRODUCTION* industry is a major user of energy and can produce significant amounts of industrial waste products. Finally, *FINANCE* industries materially influence the financial well being of societies and have a large ''social footprint.'' As a result, stakeholder groups have a keen interest in the activities of these companies.

Consistent with Ball et al. (2000), we consider companies domiciled in common law countries to have a more shareholder-orientated corporate governance model and those in code law countries to have a more stakeholder-orientated model. Firms in common law countries deal with shareholders at arm's length and as a result an increased demand for information can be expected. In code law countries there is a greater degree of insider owners, such as banks, who get their information directly from management (Ball et al. 2000). Hence, we use a dummy variable for code law/common law as a proxy for *STAKEHOLDER* orientation.

Based on insights from the literature on voluntary demand for assurance, we include the following company-related control variables in our model: size of the company (*Ln(SALES)*), profitability of the company as measured by the return on assets (*ROA*), and leverage of the company as measured by long-term debt on total assets (*LEVERAGE*). The results are run for each separate year and on a pooled basis.[11]

VI. RESULTS

Descriptive Results

As outlined earlier, we identified 2,113 sustainability reports from 31 countries in order to test H1a and H2a. Table 1, Panel A, shows that the three main countries represented are Japan (527 observations), the U.K. (385 observations) and the U.S. (339 observations). In analyzing the contents of the reports, we considered the six dimensions of the GRI framework: economic, environment, labor, human rights, product responsibility, and society. A clear dichotomy was found between reports that covered multiple issues and reports that covered a single issue.[12] As outlined in Table 1, Panel B, 1,612 of the 2,113 reports (76.3 percent) were broad, covering multiple dimensions. The other 501 reports covered a single dimension of the reports and in every one of these instances this was environment. These proportions are consistent with those reported in the KPMG (2005) survey, where 81 percent of the stand-alone sustainability reports covered multiple issues and 19 percent single issues. Because of the concerns of the potential heterogeneity of the sample, particularly on the question of assurance and the choice of assurance provider, the results will be reported both including and excluding the single issue (hereafter, environmental) reports.

Table 1, Panel C, shows that the industries represented are production (1,174 observations), utilities (365 observations), finance (268 observations), mining (119 observations) and other (187 observations). Table 1, Panel D, shows that 707 of these reports relate to year 2004 reports, 719 to 2003 reports, and 687 to reports from 2002. As expected, once

[11] The pooled analysis is run both with and without year dummies (*YEAR03* and *YEAR04*).

[12] This coding was initially undertaken by a person experienced in reading these reports. An independent second coding of 200 of the year 2004 reports' contents was undertaken by one of the authors, and not one discrepancy from the initial coding was identified.

TABLE 1
Descriptive Statistics for Database Composition and Demographics

Panel A: Frequency of Sustainability Reports and Their Assurance

Country	No Sustainability Report Frequency	Sustainability Report Frequency	Assured Frequency	Not Assured Frequency	Proportion Assured	Stakeholder- or Shareholder-Orientated	Legal Score 2002; 2003; 2004 (Average)
Australia	2,260	90	42	48	46.66%	SHAREHOLDER	1.77; 1.83; 1.82 (1.81)
Austria	175	17	8	9	47.06%	STAKEHOLDER	1.84; 1.81; 1.81 (1.82)
Belgium	275	18	3	15	16.67%	STAKEHOLDER	1.47; 1.51; 1.51 (1.50)
Brazil	370	13	5	8	38.46%	STAKEHOLDER	−0.34; −0.33; −0.33 (−0.33)
Canada	577	116	16	100	13.79%	SHAREHOLDER	1.74; 1.77; 1.8 (1.77)
Denmark	346	21	12	9	57.14%	STAKEHOLDER	1.85; 1.92; 1.97 (1.91)
Finland	285	41	12	29	29.27%	STAKEHOLDER	1.87; 1.90; 1.93 (1.90)
France	1,605	80	32	48	40.00%	STAKEHOLDER	1.28; 1.36; 1.41 (1.35)
Germany	1,603	73	13	60	17.81%	STAKEHOLDER	1.71; 1.71; 1.73 (1.72)
Greece	246	16	1	15	6.25%	STAKEHOLDER	0.69; 0.75; 0.81 (0.75)
Hong Kong	401	15	7	8	46.66%	SHAREHOLDER	1.11; 1.29; 1.37 (1.26)
India	655	8	5	3	62.50%	SHAREHOLDER	−0.02; −0.01; 0.00 (−0.01)
Italy	576	61	39	22	63.93%	STAKEHOLDER	0.77; 0.76; 0.65 (0.73)
Japan	8,743	527	182	345	34.53%	STAKEHOLDER	1.32; 1.32; 1.34 (1.33)
Malaysia	2,130	4	3	1	75.00%	SHAREHOLDER	0.41; 0.44; 0.55 (0.47)
The Netherlands	402	47	17	30	36.17%	STAKEHOLDER	1.75; 1.73; 1.77 (1.75)
New Zealand	173	11	3	8	27.27%	SHAREHOLDER	1.79; 1.86; 1.92 (1.86)

(*continued on next page*)

TABLE 1 (continued)

Country	No Sustainability Report Frequency	Sustainability Report Frequency	Assured Frequency	Not Assured Frequency	Proportion Assured	Stakeholder- or Shareholder-Orientated	Legal Score 2002; 2003; 2004 (Average)
Norway	356	17	4	13	23.52%	STAKEHOLDER	1.86; 1.91; 1.97 (1.91)
Pakistan	105	1	0	1	0.00%	STAKEHOLDER	−0.76; −0.81; −0.86 (−0.81)
Philippines	301	3	0	3	0.00%	STAKEHOLDER	−0.59; −0.62; −0.65 (−0.62)
Portugal	92	10	1	9	10.00%	STAKEHOLDER	1.22; 1.24; 1.19 (1.22)
Singapore	1,235	3	0	3	0.00%	SHAREHOLDER	1.54; 1.69; 1.82 (1.68)
South Africa	248	54	5	49	9.26%	SHAREHOLDER	0.07; 0.04; 0.15 (0.09)
South Korea	715	15	8	7	53.33%	STAKEHOLDER	0.79; 0.65; 0.7 (0.71)
Spain	299	37	16	21	43.24%	STAKEHOLDER	1.23; 1.29; 1.20 (1.24)
Sweden	713	23	3	20	13.04%	STAKEHOLDER	1.82; 1.88; 1.87 (1.86)
Switzerland	500	60	31	29	51.66%	STAKEHOLDER	1.92; 1.97; 1.98 (1.96)
Taiwan	2,026	2	0	2	0.00%	STAKEHOLDER	0.83; 0.84; 0.81 (0.83)
Thailand	862	6	0	6	0.00%	SHAREHOLDER	0.22; 0.07; 0.05 (0.11)
U.K.	2,557	385	166	219	43.11%	SHAREHOLDER	1.75; 1.75; 1.73 (1.74)
U.S.	8,049	339	21	318	6.19%	SHAREHOLDER	1.57; 1.55; 1.48 (1.53)
Total	38,880	2,113	655	1,458	30.99%		

Panel B: Type of Sustainability Report

Auditor	Frequency	Percentage
Single issue report (Environmental report)	501	23.71%
Multi issue report	1,612	76.29%
Total	2,113	100.00%

(*continued on next page*)

TABLE 1 (continued)

Panel C: Industry

Industry	No Sustainability Report Frequency	Sustainability Report Frequency	Assured Frequency	Not Assured Frequency	Proportion Assured
Production	20,175	1,174	324	850	27.59%
Utilities	3,428	365	133	232	36.43%
Finance	776	268	94	174	35.07%
Mining	1,641	119	53	66	44.53%
Other (services, etc.)	12,860	187	51	136	27.27%
Total	38,880	2,113	655	1,458	30.99%

Panel D: Year

Year	No Sustainability Report Frequency	Sustainability Report Frequency	Assured Frequency	Not Assured Frequency	Proportion Assured
2004	13,056	707	241	466	34.08%
2003	12,599	719	216	503	30.04%
2002	13,225	687	198	489	28.82%
Total	38,880	2,113	655	1,458	30.99%

(*continued on next page*)

TABLE 1 (continued)

Panel E: Details of Assurance Providers

	Frequency[a]	Percentage	No. of Countries Where Firm Assures
Auditing Profession			
Deloitte & Touche	48	17.45%	9
Ernst & Young	63	22.90%	10
KPMG	75	27.27%	11
PWC	94	34.18%	18
Other	1	0.36%	1
Assured sustainability reports involving the auditing profession	275[b]		
Outside Auditing Profession			
Environmental Resources Management (ERM)	31	7.81%	10
URS	23	5.79%	4
SGS	22	5.54%	5
CSR Network	20	5.04%	4
Bureau Veritas	18	4.53%	7
Corporate Citizen Coy	11	2.77%	2
Other	302	76.07%	1
Assured sustainability reports involving assurers outside the auditing profession	397[c]		

[a] The sum of the two subtotals for this column is 672, however 17 sustainability reports were assured by firms both within and outside the auditing profession. Thus the number of companies whose sustainability reports were assured is 655.

[b] Assurance services were provided by two Big 4 audit firms for six of these 275 sustainability reports, resulting in the frequencies of the individual firm observations totalling 281.

[c] Assurance services were provided by more than one assurer from outside the auditing profession for 30 of these 397 sustainability reports, resulting in the frequencies of the individudal firm observations totalling 427.

a company produces a sustainability report they usually continue to produce this annually. Because of repeat observations over the years, and because in an emerging service the drivers behind this service may be evolving, we report the analysis for each year as well as the pooled analysis for 2002–2004. Of the 867 separate companies producing reports over any of the three years, 552 (63.67 percent) produced reports for all three years of our sample. Furthermore, Table 1, Panel D shows that 655 (31.00 percent) of these sustainability reports (for 304 different companies) contained independent assurance reports,[13] and this subset of firms forms our sample for testing H1b and H2b.

For 275 (41.98 percent) of these 655 cases, the assurance provider was a member of the auditing profession.[14] Table 1, Panel E shows that, with one exception, all assurance by the auditing profession was provided by the Big 4, with the major assurance provider being PricewaterhouseCoopers, accounting for 34.18 percent of assurance provided by the auditing profession. The assurers from outside the profession were comprised of a number of global networks (six were identified that provided assurance in more than one country, providing in total 31.49 percent of the assurance from outside the profession), and a large number of local assurers with varying qualifications. Of the 146 companies that had their sustainability reports assured for the three years, 54 were assured by the auditing profession, of which 50 (92.59 percent) kept the same assurance provider over the three years. Of the remaining 92 companies that were assured by the non-auditing profession, 55 (59.78 percent) kept the same assurance provider over the three years.

Of the 655 companies that had their sustainability report assured, 497 had their financial statements audited by a Big 4 audit firm. Of these 497 companies, 198 (39.84 percent) also selected a Big 4 audit firm as the assurer of the sustainability report. Of the 158 companies whose financial statements were audited by other than a Big 4 audit firm, 78 (49.37 percent) selected a Big 4 audit firm as the assurer of their sustainability report. This suggests that there is little successful cross-selling of this assurance service. Of the 198 organizations that continued to use a Big 4 firm as the assurer of their sustainability report, 129 (65.15 percent) chose the same Big 4 firm that audited their financial statements.

The descriptive statistics are shown in Table 2. Our sample of companies producing sustainability reports is significantly larger, with a mean sales value of U.S.$15,042 million for those that do compared with U.S.$1,107 million for those that do not ($t = 77.77$, $p < 0.001$). They are also more profitable, with a return on assets of 3.2 percent compared with −2.3 percent ($t = 11.01$, $p < 0.001$), and their level of long-term debt to total assets is higher at 19.2 percent compared with 13.1 percent ($t = 17.14$, $p < 0.001$). With regard to the variables of interest for our hypotheses, their average *LEGAL* score is higher at 1.47 compared with 1.31 ($t = 13.92$, $p < 0.001$), suggesting that companies in stronger legal environments are more likely to produce these reports. With respect to *STAKEHOLDER*, 56.1 percent of the sample without sustainability reports and 51.6 percent of those producing sustainability reports come from code law countries and are therefore considered to be stakeholder-orientated (Ball et al. 2000), showing that a higher proportion of shareholder-orientated companies are likely to produce sustainability reports. The correlation matrix is shown in Table 3 for both the entire sample and the sample with sustainability reports. Except for the expected negative correlations between the major industry classifications, there is no absolute correlation above 0.4.

[13] The proportion of sustainability reports containing an independent assurance report is consistent with the 30 percent identified by KPMG (2005).

[14] This is a lower proportion than that reported by KPMG (2005), which identified that 58 percent of assurance observations were provided by major accountancy firms. These differences are most likely due to differences in sample composition, with KPMG's sample comprising the top 100 companies from 16 countries.

TABLE 2
Descriptive Statistics for Model Variables

Entire Sample

	Year 2002 (n = 13,912)			Year 2003 (n = 13,318)			Year 2004 (n = 13,763)			Years 2002–2004 (n = 40,993)		
	Mean	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**
SALES	1598.42	167.31	7534.74	1881.57	200.54	8700.10	1999.64	203.89	9442.95	1825.12	189.55	8591.91
LEVERAGE	0.137	0.082	0.161	0.136	0.084	0.159	0.129	0.077	0.155	0.134	0.081	0.158
ROA	−0.043	0.018	0.261	−0.017	0.024	0.216	0.0004	0.032	0.195	−0.020	0.025	0.227
LEGAL	1.310	1.540	0.515	1.328	1.550	0.534	1.317	1.41	0.525	1.318	1.480	0.525
STAKEHOLDER	0.561	1	0.496	0.551	1	0.497	0.563	1	0.495	0.559	1	0.496

Sample without Sustainability Reports

	Year 2002 (n = 13,225)			Year 2003 (n = 12,599)			Year 2004 (n = 13,056)			Years 2002–2004 (n = 38,880)		
	Mean	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**	**Mean**	**Median**	**Std. Dev.**
SALES	1002.93	147.19	4715.21	1125.73	176.87	5104.84	1193.85	178.74	5564.73	1106.83	166.77	5139.13
LEVERAGE	0.134	0.076	0.161	0.133	0.078	0.159	0.127	0.072	0.155	0.131	0.075	0.158
ROA	−0.047	0.017	0.266	−0.020	0.024	0.222	−0.001	0.031	0.199	−0.023	0.024	0.232
LEGAL	1.301	1.47	0.519	1.319	1.55	0.539	1.309	1.41	0.529	1.310	1.470	0.529
STAKEHOLDER	0.564	1	0.495	0.554	1	0.497	0.565	1	0.495	0.561	1	0.496

(*continued on next page*)

TABLE 2 (continued)

Sample with Sustainability Reports

	Year 2002 (n = 687)			Year 2003 (n = 719)			Year 2004 (n = 707)			Years 2002–2004 (n = 2,113)		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
SALES	13061.72	5098.87	24170.84	15126.22	5930.35	27585.41	16879.88	6985.28	30525.65	15041.76	5934.11	27610.8
LEVERAGE	0.196	0.176	0.149	0.195	0.177	0.148	0.183	0.170	0.138	0.192	0.174	0.145
ROA	0.015	0.020	0.108	0.035	0.028	0.061	0.045	0.038	0.058	0.032	0.029	0.079
LEGAL	1.477	1.57	0.405	1.477	1.55	0.414	1.464	1.48	0.418	1.473	1.550	0.412
STAKEHOLDER	0.509	1	0.500	0.513	1	0.500	0.526	1	0.499	0.516	1	0.499

Variable Definitions:
SALES = sales in millions U.S.$;
LEVERAGE = long-term debt/total assets;
ROA = return on assets, net profit (loss)/total assets;
LEGAL = legal environment; rule of law score developed by the World Bank (Kaufmann 2006); the ''Rule of Law'' score measures the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence; and
STAKEHOLDER = dummy variable where company domiciled in code law country equals 1.

TABLE 3
Correlation Matrix

Entire Sample (n = 40,993)

	Ln(Sales)	*LEVERAGE*	*ROA*	*MINING*	*PRODUCTION*	*UTILITIES*	*FINANCE*	*OTHER*	*STAKEHOLDER*	*LEGAL*
Ln(Sales)	1									
LEVERAGE	0.234	1								
ROA	0.349	−0.033	1							
MINING	−0.237	−0.024	−0.082	1						
PRODUCTION	0.055	−0.070	0.062	−0.220	1					
UTILITIES	0.129	0.233	0.018	−0.067	−0.332	1				
FINANCE	0.003	0.037	0.009	−0.034	−0.167	−0.051	1			
OTHER	−0.029	−0.072	−0.047	−0.141	−0.699	−0.214	−0.108	1		
STAKEHOLDER	0.051	−0.115	0.108	−0.175	0.110	−0.034	−0.051	0.005	1	
LEGAL	0.039	0.044	−0.125	0.104	−0.127	−0.019	0.014	0.104	−0.143	1

Sample with Sustainability Reports (n = 2,113)

	Ln(Sales)	*LEVERAGE*	*ROA*	*MINING*	*PRODUCTION*	*UTILITIES*	*FINANCE*	*OTHER*	*STAKEHOLDER*	*LEGAL*
Ln(Sales)	1									
LEVERAGE	−0.012	1								
ROA	−0.026	−0.132	1							
MINING	−0.140	0.016	0.075	1						
PRODUCTION	0.007	−0.184	0.100	−0.269	1					
UTILITIES	0.004	0.364	−0.118	−0.110	−0.510	1				
FINANCE	0.022	−0.191	−0.089	−0.091	−0.420	−0.174	1			
OTHER	0.070	0.047	0.032	−0.075	−0.348	−0.142	−0.118	1		
STAKEHOLDER	0.113	−0.114	−0.057	−0.161	0.220	−0.021	−0.149	−0.051	1	
LEGAL	0.064	0.050	−0.012	0.042	−0.019	−0.010	−0.013	0.030	−0.226	1

Variable Definitions:
MINING = dummy variable equal to 1 if company is in mining industry;
PRODUCTION = dummy variable equal to 1 if company is in production industry;
UTILITIES = dummy variable equal to 1 if company is in utilities industry;
FINANCE = dummy variable equal to 1 if company is in finance industry; and
OTHER = company is in other than the mining, production, utilities, or finance industries.

Multivariate Results

As we outlined earlier, because the emphasis in this paper is on the assurance decision, we include an analysis of the factors associated with the decision to produce sustainability reports as background information only. A significant prior literature (see for example Berthelot et al. 2003; Cormier and Magnan 1999) already focuses on understanding the incentives to produce sustainability or environmental reports and we do not seek to replicate that research here. This background information on the decision to produce sustainability reports is obtained by using sequential logit with the decision to report as the first stage of that analysis. The statistical model (Equation (1) above) is run with those companies who do not produce a sustainability report taking a value of 0, and those reporting taking a value of 1.

Further, as outlined earlier, because of concerns about the potential heterogeneity of the reporting entities, we distinguished between those that produced an environmental (single issue) report, and those that produced a sustainability report covering multiple dimensions. For this reason, the results for the decision to assure and the choice of assurance provider are reported separately for all companies producing sustainability reports, and only companies producing multiple issue sustainability reports. The discussion of the multivariate results using sequential logit analysis[15] will cover all observations in the first place, and then an analysis of the results which excludes those companies producing single issue environmental reports. It will also include an initial discussion of the results pooled for 2002–2004, followed by a discussion of the differences in the results for the single years.

Background Information on the Decision to Produce Sustainability Reports

We find that large companies ($t = 54.72$, $p < 0.001$, two-tailed) and more highly leveraged companies ($t = 2.28$, $p < 0.05$, two-tailed) are more likely to produce stand-alone sustainability reports (see Table 4, Part 1). With regard to the industry characteristics we find that companies in the mining ($t = 16.59$, $p < 0.001$, two-tailed), production ($t = 17.19$, $p < 0.001$, two-tailed), utilities ($t = 13.51$, $p < 0.001$, two-tailed), and finance ($t = 24.45$, $p < 0.001$, two-tailed) industries are more likely to produce sustainability reports than companies in the other industries. In relation to country-specific variables, companies residing in stakeholder countries ($t = 3.57$, $p < 0.001$, two-tailed) and countries with stronger legal environments ($t = 6.64$, $p < 0.001$, two-tailed) are more likely to produce sustainability reports.

Decision to Voluntarily Purchase Assurance

For those companies that produced sustainability reports, the results of the sequential logit analysis of the factors associated with the decision as to whether to have these reports assured is outlined in Table 4, Part 2. In examining the control variables, we find that large companies (*Ln(SALES)*) are significantly more likely to have their sustainability reports assured compared to small companies ($t = 3.81$, $p < 0.001$, two-tailed), while financial risk (*LEVERAGE*) was not associated with this decision ($t = 1.22$, $p > 0.1$, two-tailed). Profitability (*ROA*) was significant in 2004, causing this variable to be marginally significant for the pooled analysis examining all sustainability reports ($t = 1.71$, $p < 0.1$, two-tailed), but was not significant for any of the periods when environmental reports were excluded.

With respect to our hypotheses we find strong support for H1a, which states that companies with a higher need to enhance credibility will be more likely to have their sustainability reports assured. In particular, we find that companies in three of our four categories

[15] We also run the analyses with separate logistic regression analyses, with the same results.

TABLE 4
Results from Each Part of the Sequential Logit Model

	Sample Including Environmental Reports				Sample Excluding Environmental Reports			
Part 1: Reporting	**2002 n = 13,912**	**2003 n = 13,318**	**2004 n = 13,763**	**2002–2004 n = 40,993**	**2002**	**2003**	**2004**	**2002–2004**
Constant	−11.950 (−29.68)***	−12.393 (−31.30)***	−12.708 (−32.40)***	−12.284 (−53.99)***				
Ln(SALES)	0.971 (30.75)***	1.015 (31.85)***	1.036 (32.09)***	1.004 (54.72)***				
LEVERAGE	0.143 (0.46)	0.502 (1.52)	0.712 (2.09)**	0.430 (2.28)**				
ROA	0.052 (0.13)	1.510 (2.11)**	1.675 (2.16)**	0.613 (1.61)				
MINING	2.865 (10.89)***	2.631 (9.79)***	2.214 (8.02)***	2.573 (16.59)***				
PRODUCTION	1.555 (9.77)***	1.620 (10.28)***	1.461 (9.68)***	1.543 (17.19)***				
UTILITIES	1.596 (8.44)***	1.463 (7.83)***	1.296 (7.08)***	1.449 (13.51)***				
FINANCE	3.658 (14.98)***	3.442 (13.81)***	3.338 (13.62)***	3.476 (24.45)***				
STAKEHOLDER	0.236 (2.27)**	0.186 (1.80)*	0.242 (2.37)**	0.211 (3.57)***				
LEGAL	0.563 (3.57)***	0.546 (3.76)***	0.602 (4.19)***	0.569 (6.64)***				

(*continued on next page*)

TABLE 4 (continued)

	Sample Including Environmental Reports				Sample Excluding Environmental Reports			
Part 2: Assurance	**2002 n = 687**	**2003 n = 719**	**2004 n = 707**	**2002–2004 n = 2,113**	**2002 n = 488**	**2003 n = 538**	**2004 n = 586**	**2002–2004 n = 1,612**
Constant	−3.071	−3.591	−2.517	−2.995	−2.902	−3.095	−2.596	−2.825
	(−4.38)***	(−4.70)***	(−3.39)***	(−7.16)***	(−3.73)***	(−3.82)***	(−3.20)***	(−6.25)***
Ln(SALES)	0.079	0.162	0.139	0.129	−0.004	0.126	0.134	0.096
	(1.38)	(2.66)***	(2.33)**	(3.81)***	(−0.07)	(1.78)*	(2.02)**	(2.51)**
LEVERAGE	0.447	0.793	0.212	0.479	0.312	0.420	0.295	0.324
	(0.66)	(1.23)	(0.30)	(1.22)	(0.40)	(0.58)	(0.39)	(0.73)
ROA	1.187	0.060	3.541	1.594	1.563	−0.901	2.591	1.215
	(1.15)	(0.03)	(2.15)**	(1.71)*	(1.25)	(−0.61)	(1.61)	(1.36)
MINING	1.275	1.198	0.948	1.151	1.555	1.121	1.101	1.236
	(2.83)***	(2.67)***	(2.12)**	(4.47)***	(3.06)***	(2.42)**	(2.34)**	(4.56)***
PRODUCTION	−0.081	0.143	−0.078	0.000	0.311	0.104	0.058	0.145
	(−0.25)	(0.45)	(−0.27)	(0.00)	(0.77)	(0.31)	(0.19)	(0.75)
UTILITIES	0.348	0.559	0.470	0.465	0.939	0.685	0.769	0.775
	(0.95)	(1.57)	(1.43)	(2.32)**	(2.11)**	(1.81)*	(2.17)**	(3.50)***
FINANCE	0.633	0.725	0.460	0.592	0.869	0.536	0.504	0.589
	(1.63)	(1.83)*	(1.20)	(2.64)***	(1.91)*	(1.29)	(1.25)	(2.45)**
STAKEHOLDER	0.607	0.657	0.700	0.639	0.742	0.903	1.042	0.902
	(3.18)***	(3.59)***	(3.93)***	(6.03)***	(3.34)***	(4.51)***	(5.50)***	(7.77)***
LEGAL	0.577	0.320	−0.072	0.237	0.691	0.267	−0.079	0.238
	(2.36)**	(1.36)	(−0.34)	(1.84)*	(2.62)***	(1.11)	(−0.35)	(1.78)*

(*continued on next page*)

TABLE 4 (continued)

	Sample Including Environmental Reports				Sample Excluding Environmental Reports			
Part 3: Assurance Provider	**n = 198**	**n = 216**	**n = 241**	**n = 655**	**n = 143**	**n = 167**	**n = 217**	**n = 527**
Constant	−2.755 (−1.91)*	−0.775 (−0.59)	−1.94 (−1.51)	−1.774 (−2.35)**	−4.273 (−2.33)**	−1.192 (−0.85)	−1.878 (−1.40)	−2.092 (−2.55)**
Ln(SALES)	0.150 (1.43)	0.086 (0.83)	0.254 (2.43)**	0.170 (2.90)***	0.214 (1.58)	0.154 (1.31)	0.225 (2.02)**	0.200 (2.97)***
LEVERAGE	−1.360 (−1.12)	−3.537 (−2.72)***	−1.191 (−1.00)	−1.953 (−2.90)***	−1.812 (−1.06)	−3.579 (−2.33)**	−1.316 (−1.05)	−2.166 (−2.73)***
ROA	1.355 (0.47)	−3.386 (−1.71)*	−4.088 (−1.27)	−1.754 (−1.39)	2.148 (0.50)	−4.069 (−1.85)*	−3.377 (−0.98)	−2.211 (−1.51)
MINING	1.225 (1.46)	0.454 (0.55)	0.492 (0.67)	0.642 (1.41)	2.108 (1.78)*	0.740 (0.86)	0.640 (0.86)	0.915 (1.88)*
PRODUCTION	0.131 (0.22)	0.337 (0.58)	−0.461 (−0.90)	−0.040 (−0.12)	1.056 (1.08)	0.592 (0.94)	−0.278 (−0.53)	0.258 (0.70)
UTILITIES	0.617 (0.90)	1.108 (1.56)	−0.168 (−0.28)	0.461 (1.22)	1.458 (1.25)	1.268 (1.60)	−0.074 (−0.12)	0.646 (1.50)
FINANCE	0.595 (0.86)	0.232 (0.34)	−0.006 (−0.01)	0.233 (0.62)	1.424 (1.33)	0.409 (0.56)	0.187 (0.31)	0.459 (1.11)
STAKEHOLDER	1.856 (4.05)***	1.238 (3.36)***	1.135 (3.16)***	1.319 (6.03)***	1.907 (3.41)***	1.116 (2.79)***	1.175 (3.11)***	1.272 (5.38)***
LEGAL	−0.185 (−0.36)	−0.501 (−1.13)	−0.477 (−1.21)	−0.421 (−1.65)*	−0.047 (−0.08)	−0.689 (−1.48)	−0.478 (−1.21)	−0.479 (−1.79)*
Log pseudolikelihood (Wald chi-squared)	−2136.58 (1196.00)***	−2175.48 (1252.07)***	−2186.14 (1262.00)***	−6522.50 (3705.62)***	−1620.71 (989.40)***	−1718.87 (1049.75)***	−1868.61 (1114.93)***	−5233.79 (3142.50)***

*, **, *** Significantly different from zero at the $\alpha = 0.10$, 0.05, and 0.01 levels, respectively, for two-tailed tests.

of industries that are expected to require enhanced credibility of published reports: *MINING* ($t = 4.47$, $p < 0.001$, two-tailed), *UTILITIES* ($t = 2.32$, $p < 0.05$, two-tailed) and *FINANCE* ($t = 2.64$, $p < 0.01$, two-tailed), but not *PRODUCTION* ($t = 0.00$, $p > 0.10$, two-tailed), are more likely to have their sustainability reports assured.

With regard to H2a, we find that *STAKEHOLDER* is significant ($t = 6.03$, $p < 0.001$, two-tailed), indicating that those companies in stakeholder countries are more likely to have their sustainability reports assured. However, this finding must be considered in light of the additional analysis reported later in this paper, which shows that this result is primarily attributable to a U.S. effect. *LEGAL* is *positively* significant ($t = 1.84$, $p < 0.1$, two-tailed), suggesting that those in the stronger legal system are more likely to be assured. Opposite to what was expected on the basis of findings for the quality of financial report assurance (Choi and Wong 2007), it appears that in weaker legal environments, assurance is not used to increase user confidence in the credibility of sustainability reports. As outlined earlier, a potential alternative explanation is that the public's perceived credibility of this type of assurance service is low in countries with a weak legal environment, and therefore the benefits of assurance for companies do not outweigh the costs. Of relevance here is the decrease in this variable's significance over the period 2002–2004, suggesting that while this may have been an appropriate alternative explanation in 2002, it does not appear to be the situation in 2004. A similar result is found when environmental reports are excluded from the analysis.[16]

Choice of Assurance Provider

The results of the sequential logit analysis for choice of assurance provider for those companies that have their sustainability reports assured is contained in Part 3 of Table 4. In analyzing the control variables we find a significant positive association between the size of the company and the choice of a member of the auditing profession as assurance provider ($t = 2.90$, $p < 0.01$, two-tailed), while there is no significant association between profitability of a company in the form of return on assets and assurance provider ($t = -1.39$, $p > 0.1$, two-tailed). Members of the auditing profession are also found to be more likely to be the assurance provider for companies with lower leverage ($t = -2.90$, $p < 0.01$, two-tailed). It is possible that this is a result of the auditing profession being less likely to associate with companies with higher levels of financial risk.

The results show little support for H1b, i.e., that those companies with a higher need to enhance credibility are more likely to choose assurance from the auditing profession. In particular, legal environment (*LEGAL*) is marginally significant ($t = -1.65$, $p < 0.10$, two-tailed), while companies in the mining, production, utilities, and finance industries are no more likely to choose a member of the auditing profession as their assurance provider than other companies. The lack of significant results holds across all years, both including and excluding environmental reports.[17]

The results provide strong support for H2b, that companies domiciled in countries that are more stakeholder-orientated are more likely ($t = 6.03$, $p < 0.01$, two-tailed) to choose assurance from the auditing profession compared with companies domiciled in countries that are more shareholder-orientated. As distinct from the analysis of the assurance decision,

[16] For the decision to voluntarily purchase assurance, similar results are found for the pooled analysis when dummy variables are included for 2003 and 2004. The 2004 dummy variable is marginally significant ($t = 1.79$, $p < 0.10$, two-tailed), suggesting 2004 sustainability reports are more likely to be assured than 2002 reports, consistent with the descriptive statistics reported in Table 1.

[17] *MINING* was marginally significant for the pooled analysis excluding environmental reports ($t = 1.88$, $p < 0.10$, two-tailed).

this finding holds when the U.S. observations are excluded, as reported in the following additional analysis.

VII. SENSITIVITY ANALYSIS

While it is necessary to include all countries in order to properly analyze and gain an understanding of this international assurance service, it is possible that certain countries may be influencing the results. In analyzing assurance services by the countries that constitute a significant proportion of our observations, we identify that assurance of sustainability reports is far lower in the U.S. than in other major countries. This may be due to the country's attestation standards existing at the time, concerns over whether suitable criteria exist for such engagements and/or fear of litigation (Ballou et al. 2006).[18] With the U.S. also rating as strongly shareholder-orientated, we indeed find the results for the variable ''stakeholder'' in the assurance decision to be different depending on whether observations from the U.S. are included. The exclusion does not affect the interpretation of any other results, as outlined in Table 5.

The results when including the U.S. observations show that companies in stakeholder countries are more likely to have their sustainability reports assured. This finding is entirely attributable to the U.S., as after excluding U.S. observations we find that there are no longer significant results for *STAKEHOLDER* with regard the decision to assure, across all years and both including and excluding environmental reports. However (and irrespective of whether the U.S. observations are included or excluded), once a decision to assure has been made, companies in *STAKEHOLDER* countries are more likely to choose a member of the auditing profession as their assurance provider.

We also observe that a large number of observations come from two other countries, Japan (527 (24.94 percent)) and the U.K. (385 (18.22 percent)). Including dummies for U.K. and Japan does not change the results, with the exception that, for the decision to assure, the legal variable is no longer significant, while at the same time the U.K. dummy is significantly positive. The correlation between *LEGAL* and U.K. is 0.3091, suggesting that what we see as a legal effect on the decision to assure is primarily due to observations from the U.K.

VIII. CONCLUSION

This paper aims to develop an understanding of the international market for assurance services provided on general-purpose, stand-alone sustainability reports and the factors associated with the demand for such assurance and the choice of assurance provider. We use sequential logit analysis to: (1) provide background information on the factors associated with the decision to produce these comprehensive reports; (2) for those that do produce, the factors associated with having such information assured; and (3) for those that do have this information assured, the factors associated with the choice of assurance provider. In particular, by providing insights into the market for assurance of sustainability reports and the market share captured by members of the auditing profession, we aim to inform the international assurance standard setting process in this new and growing field.

The results of this study generally support our empirical predictions that the incidence of assurance of sustainability reports is higher for companies with a greater need to enhance

[18] The American Institute of Certified Practicing Accountants (AICPA) standards on attest engagements (AT Section 101) allow such assurance engagements in certain circumstances including that the practitioner must have adequate technical training and proficiency, knowledge of the subject matter and reason to believe that the subject matter is capable of evaluation against criteria that are suitable and available to the user. This is consistent with the requirements of the International Standard on Assurance Engagements (ISAE) 3000.

TABLE 5
Results from the Sequential Logit Model for Sample without the U.S.

	Sample Including Environmental Reports				Sample Excluding Environmental Reports			
Reporting	**2002 n = 10,991**	**2003 n = 10,521**	**2004 n = 11,093**	**2002–2004 n = 32,605**	**2002**	**2003**	**2004**	**2002–2004**
Constant	−11.676 (−29.53)***	−12.182 (−30.64)***	−12.164 (−31.51)***	−11.918 (−53.11)***				
Ln(SALES)	1.053 (28.74)***	1.104 (29.75)***	1.091 (30.19)***	1.078 (51.22)***				
LEVERAGE	0.719 (1.92)*	1.259 (3.12)***	1.382 (3.35)***	1.099 (4.82)***				
ROA	0.217 (0.42)	2.297 (2.66)***	1.479 (1.61)	0.799 (1.75)*				
MINING	2.728 (8.81)***	2.470 (7.68)***	2.104 (6.51)***	2.433 (13.29)***				
PRODUCTION	1.583 (8.95)***	1.641 (9.31)***	1.533 (8.91)***	1.584 (15.72)***				
UTILITIES	1.602 (7.48)***	1.431 (6.85)***	1.273 (6.07)***	1.435 (11.83)***				
FINANCE	4.044 (15.14)***	3.740 (13.25)***	3.548 (12.98)***	3.773 (23.83)***				
STAKEHOLDER	−0.892 (−7.47)***	−0.961 (−7.96)***	−0.810 (−6.64)***	−0.898 (−12.94)***				
LEGAL	0.623 (4.93)***	0.584 (5.04)***	0.539 (4.75)***	0.570 (8.38)***				

(*continued on next page*)

TABLE 5 (continued)

	Sample Including Environmental Reports				Sample Excluding Environmental Reports			
Assurance	**2002 n = 575**	**2003 n = 605**	**2004 n = 594**	**2002–2004 n = 1,774**	**2002 n = 383**	**2003 n = 431**	**2004 n = 478**	**2002–2004 n = 1,292**
Constant	−3.139	−3.769	−2.959	−3.236	−3.090	−3.464	−3.125	−3.223
	(−4.39)***	(−4.78)***	(−3.80)***	(−7.49)***	(−3.74)***	(−4.05)***	(−3.69)***	(−6.75)***
Ln(SALES)	0.175	0.253	0.262	0.231	0.116	0.243	0.280	0.223
	(2.77)***	(3.74)***	(3.79)***	(6.07)***	(1.56)*	(3.01)***	(3.52)***	(5.02)***
LEVERAGE	0.457	0.894	0.200	0.524	0.502	0.785	0.321	0.548
	(0.65)	(1.32)	(0.27)	(1.27)	(0.61)	(1.03)	(0.40)	(1.18)
ROA	0.990	0.131	3.185	1.331	1.096	−1.160	1.870	0.761
	(1.11)	(0.07)	(1.85)*	(1.56)	(1.16)	(−0.74)	(1.14)	(1.03)
MINING	1.174	1.032	0.899	1.066	1.417	0.940	1.007	1.126
	(2.45)**	(2.17)**	(1.91)*	(3.90)***	(2.61)***	(1.91)*	(2.08)**	(3.92)***
PRODUCTION	−0.012	0.265	0.284	0.199	0.388	0.246	0.415	0.364
	(−0.03)	(0.75)	(0.86)	(1.00)	(0.88)	(0.68)	(1.24)	(1.70)*
UTILITIES	0.461	0.673	0.759	0.651	1.028	0.776	1.038	0.942
	(1.17)	(1.77)*	(2.10)**	(2.99)***	(2.15)**	(1.90)*	(2.68)***	(3.91)***
FINANCE	0.530	0.683	0.511	0.575	0.725	0.459	0.484	0.534
	(1.29)	(1.64)	(1.23)	(2.41)**	(1.50)	(1.05)	(1.13)	(2.10)**
STAKEHOLDER	−0.020	0.061	−0.028	−0.008	0.070	0.251	0.251	0.197
	(−0.09)	(0.30)	(−0.14)	(−0.07)	(0.29)	(1.12)	(1.18)	(1.53)
LEGAL	0.437	0.206	−0.215	0.112	0.512	0.136	−0.241	0.090
	(1.98)**	(0.95)	(−1.08)	(0.94)	(2.22)**	(0.62)	(−1.15)	(0.75)

(*continued on next page*)

TABLE 5 (continued)

	Sample Including Environmental Reports				Sample Excluding Environmental Reports			
Assurance Provider	**2002 n = 192**	**2003 n = 208**	**2004 n = 234**	**2002–2004 n = 634**	**2002 n = 138**	**2003 n = 161**	**2004 n = 212**	**2002–2004 n = 511**
Constant	−2.723	−0.665	−1.977	−1.776	−4.156	−1.028	−1.697	−1.970
	(−1.89)*	(−0.51)	(−1.54)	(−2.35)**	(−2.29)**	(−0.74)	(−1.27)	(−2.41)**
Ln(SALES)	0.143	0.082	0.259	0.170	0.201	0.147	0.232	0.200
	(1.36)	(0.79)	(2.49)**	(2.90)***	(1.50)	(1.25)	(2.09)**	(2.97)***
LEVERAGE	−1.240	−3.445	−1.114	−1.828	−1.731	−3.623	−1.465	−2.185
	(−1.00)	(−2.53)**	(−0.93)	(−2.58)**	(−1.00)	(−2.31)**	(−1.18)	(−2.72)***
ROA	0.870	−3.99	−3.759	−1.949	1.408	−4.856	−3.218	−2.185
	(0.32)	(−1.86)*	(−1.18)	(−1.56)	(0.33)	(−2.01)**	(−0.94)	(−2.72)*
MINING	1.235	0.550	0.596	0.716	2.113	0.864	0.581	0.918
	(1.47)	(0.66)	(0.77)	(1.55)	(1.79)*	(0.99)	(0.75)	(1.85)*
PRODUCTION	0.137	0.363	−0.409	0.009	1.058	0.631	−0.386	0.231
	(0.23)	(0.62)	(−0.75)	(0.03)	(1.11)	(0.99)	(−0.70)	(0.62)
UTILITIES	0.598	1.073	−0.157	0.463	1.434	1.255	−0.196	0.590
	(0.88)	(1.50)	(−0.26)	(1.22)	(1.25)	(1.58)	(−0.31)	(1.35)
FINANCE	0.605	0.205	−0.005	0.247	1.424	0.374	0.004	0.382
	(0.88)	(0.30)	(−0.01)	(0.65)	(1.34)	(0.52)	(0.01)	(0.91)
STAKEHOLDER	1.870	1.174	1.065	1.279	1.914	1.048	1.061	1.210
	(3.85)***	(3.04)***	(2.89)***	(5.62)***	(3.21)***	(2.50)**	(2.80)***	(4.96)***
LEGAL	−0.184	−0.513	−0.481	−0.429	−0.051	−0.705	−0.486	−0.493
	(−0.35)	(−1.17)	(−1.24)	(−1.70)*	(−0.08)	(−1.52)	(−1.27)	(−1.87)*
Log pseudolikelihood	−1670.91	−1700.88	−1749.66	−5147.14	−1193.20	−1277.95	−1453.73	−3950.37
(Wald chi-squared)	(1049.12)***	(1109.98)***	(1145.41)***	(3296.11)***	(821.45)***	(897.06)***	(982.96)***	(2686.14)***

*, **, *** Significantly different from zero at the $\alpha = 0.10$, 0.05, and 0.01 levels, respectively, for two-tailed tests.

credibility. Our results demonstrate the demand for assurance is higher among companies engaging in more highly visible industrial activity and companies with a larger ''social footprint,'' with companies in *MINING*, *UTILITIES*, and *FINANCE* all being more likely to have their sustainability reports assured. We also find that companies in stakeholder countries are more likely to have their sustainability reports assured. However, this latter finding must be considered in light of the additional analysis reported in this paper that shows that this result is attributable to a U.S. effect. The results further suggest that sustainability reports in the stronger legal system are more likely to be assured, although the decrease in this variable's significance over the period of the study suggests that this factor is less significant in 2004 than it was in 2002, possibly as a result of the evolution and greater acceptance of this assurance service in the global market over this period of time.

With respect to the choice of assurance provider, we do not find that companies domiciled in countries with weak legal environments or belonging to industries with higher environment and social risks are more likely to choose a member of the auditing profession as their assurance provider. Combining the findings of the decision to purchase assurance and the choice of provider, the important decision for industries needing to enhance credibility appears to be the decision to assure the information in the sustainability report, and the determination of whether the assurance provider is a member of the auditing profession is less important.

We do find strong evidence of an association between the choice of assurance provider and the stakeholder orientation of a company's country of domicile, with companies from stakeholder-orientated countries being more likely to choose a member of the auditing profession as their assurance provider. As distinct from the analysis of the assurance decision, this finding holds irrespective of whether the U.S. observations are included or excluded. This finding shows the importance of considering country-specific characteristics in gaining an understanding of the international assurance market. This is further reinforced by the fact that the initial result of a positive association between stakeholder-oriented countries and the decision to assure (but not the choice of assurance provider) is attributable entirely to the U.S. Considering country-specific characteristics is particularly important for understanding global assurance services, where the U.S. has historically had regulations in place that are unique to that country. Hence, our results contribute to the growing body of literature highlighting the importance of county-specific factors when considering accounting and assurance issues at an international level.

These conclusions must be moderated by the following considerations. First, while the search techniques for identifying publicly available sustainability reports were comprehensive, they were not exhaustive. In particular, there is the possibility of a bias against reports that were not translated into English. Nonetheless, there were still a significant number of observations from non-English-speaking countries, including the fact that the highest number of observations came from Japan. We also note that the representation of countries in this study is consistent with surveys examining the extent to which companies prepare sustainability reports (KPMG 2005). Additionally, the requirement to supplement the reports by financial and other information for the purpose of the analysis means that smaller companies are less likely to be included in our analysis as they are less likely to appear on the types of databases used to provide the additional financial and other information.

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