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DETERMINANTS OF THE ADOPTION OF SUSTAINABILITY ASSURANCE STATEMENTS: AN INTERNATIONAL INVESTIGATION

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ABSTRACT

This paper explores the factors associated with the voluntary decisions to assure social, environmental and sustainability reports. Since the market for assurance services in this area is in its formative stages, there is a limited understanding of the demand for this emergent non-financial auditing practice, which is evolving rapidly across different countries. Drawing from extant literature in international auditing and environmental accounting, we focus on a set of country-level institutional factors to explain the adoption of sustainability assurances statements among an international panel of 212 Fortune Global 250 companies for the years 1999, 2002 and 2005. Consistently with our expectations, our results provide evidence that companies operating in countries that are more stakeholder-oriented and have a weaker governance enforcement regime are more likely to adopt a sustainability assurance statement. Further, the demand for assurance is higher in countries where sustainable corporate practices are better enabled by market and institutional mechanisms. Our exploratory findings also indicate that the likelihood to choose a large accounting firm as assurance provider increases for companies domiciled in countries that are shareholder-oriented and have a lower level of litigation. We conclude the paper suggesting three directions of research in the area of sustainability assurance that have relevant academic and practical implications.

Keywords: reporting; assurance; auditing; sustainability; multinationals; stakeholders

DETERMINANTS OF THE ADOPTION OF SUSTAINABILITY ASSURANCE STATEMENTS: AN INTERNATIONAL INVESTIGATION

INTRODUCTION

Recent surveys document the rise of assurance engagements in the area of environmental management and sustainability, as a result of increased availability of auditing guidelines or guidance statements issued by bodies such as AccountAbility, the European Federation of Accountants and the Global Reporting Initiative (CPA Australia, 2004; Deegan *et al.*, 2006; FEE, 2002, 2004, 2005; NIVRA, 2004; Zadek and Raynard, 2004). Assurance for sustainability reporting is a practice in its formative stages, but it is evolving rapidly (FEE, 2006; IFAC, 2006). A greater number of organizations rely on assurance engagements in order to improve the credibility and transparency of disclosed environmental and social information (KPMG, 2005). Despite these developments, academic research on these novel forms of non-financial assurance services has been scarce so far (Hasan *et al.*, 2005; IFAC, 2002). As a result, there is limited understanding of the nature and extent of this emergent auditing practice (Hasan *et al.*, 2005; Jamal *et al.*, 2003; Knechel *et al.*, 2006), in contrast with the literature on the determinants and effects of voluntary social and environmental reporting (see, for example, Berthelot *et al.*, 2003; Brammer and Pavelin, 2006; Brown and Fraser, 2006; Cormier *et al.*, 2005; Lee and Hutchison, 2005).

The objective of this paper is to explore the factors associated with the voluntary adoption of sustainability assurance statements. We specifically focus our analysis on a set of country-level characteristics that are likely to explain the demand of assurance of environmental and social reports. To test our propositions, we use an international dataset of a panel of Fortune Global 250 firms that published reports in 1999, 2002 and 2005. Our paper draws on two evolving streams of literatures in environmental accounting and international auditing, to which it seeks to contribute. First, it provides exploratory insights about the adoption decision of assurance services for sustainability reporting, thereby extending prior limited research focused on environmental and sustainability assurance statements in the accounting literature (e.g. Ball *et al.*, 2000a; O'Dwyer and Owen, 2005). Second, it builds upon recent literature in international accounting and auditing that aims at explaining differences in audit markets and choice of governance structures on a cross-country basis. Recent papers in this vein include Barton (2005), Fan and Wong (2005), Francis *et al.* (2007), Choi and Wong (2007) and Choi *et al.* (2008). Overall, this paper contends that a better understanding of the voluntary adoption of assurance services in this emergent setting may also have broader implications for non-financial assurance services in general, given that the provision of assurance statements to sustainability reports is currently the largest part of assurance engagements accompanying so-called special purpose reports (Hasan *et al.*, 2005).

The paper is organized as follows. We first provide an overview of recent developments in the area of sustainability assurance. We then discuss the studies available in environmental accounting that examined assurance statements in the area of sustainability and relate them to the limited literature focusing on assurance services in auditing research. Next we motivate our focus on country-level institutional determinants of sustainability assurance adoption and develop a set of testable predictions. The subsequent section presents the sample data and the variables used to test the hypotheses, followed by the empirical results. The paper concludes with a discussion and suggestions for future research.

OVERVIEW OF PRIOR RESEARCH

Recent years have seen a growth in the voluntary adoption of sustainability reporting in response to both stakeholders concerned with social and environmental performance and investors that rely on this type of non-financial data as an indicator of underlying corporate risks and likely future financial performance (Kolk, 2003, 2004; Trucost plc and Environmental Agency, 2004). An important driver in improving the quality of social and environmental reports has been the Sustainability Reporting Guidelines of the Global Reporting Initiative (GRI, 2002), which set out a common framework for sustainability reporting. This broadening of focus in reporting has expanded the scope of traditional assurance engagements (Beets and Souther, 1999; Dixon *et al.*, 2004; Wallage, 2000).

The analysis in the 2002 KPMG Survey of Corporate Responsibility Reporting (2002, p.18) suggests that the increased adoption of sustainability assurance arises from "...the demand for reliable and credible information from management, for managing the company's environmental and social risks, and from stakeholders who want assurance that the report truly represents the company's efforts and achievements". Similarly, the Federation of European Accountants (FEE, 2002) encourages companies to raise shareholder confidence by enhancing the credibility of their sustainability reporting with third-party, independent assurance. These claims are consistent with prior research in auditing indicating that voluntary, third-party assurance provides greater user confidence in the reliability and accuracy of the information disclosed (Carey *et al.*, 2000). From an agency theory perspective, the demand for assurance stems from the need to mitigate agency costs associated with information asymmetry with institutional creditors and resultant loss of control due to a lack of observability of managers' behaviour (Chow, 1982).

The need for credibility of such reporting to both internal and external audiences has accelerated the development of relevant assurance frameworks (FEE, 2004, 2006; Iansen-Rogers and Oelschlaegel, 2005; ICAEW, 2004; UNEP Finance Initiative, 2004; Zadek and Raynard, 2004). Two international standards, both used by assurance practitioners to provide sustainability assurance but designed for different objectives, have taken a dominant role. The AA1000 Assurance Standard (AA1000AS) was launched in March 2003 by AccountAbility (AccountAbility, 2003a, 2003b), while the IAASB's International Standard on Assurance Engagements (ISAE3000) (IAASB, 2003) is available since January 2005. Further, a number of national (draft) standards has also emerged, for instance in Australia (Standards Australia, 2003) and in The Netherlands (Royal NIVRA, 2005). More recently, the latest sustainability reporting framework developed by GRI (G3 Guidelines) contains recommendations for reporting companies in their approach to the external assurance of sustainability reports. While AA1000AS, ISAE3000 and the GRI Guidelines do not directly compete amongst themselves, indeed some assurance providers reference them in different combinations since they overlap in the minimum content of assurance (for a comparison among standards, see O'Dwyer and Owen, 2005).

The recent adoption of assurance services for sustainability is documented by various surveys of practice. From the 2005 KPMG Survey of Corporate Responsibility Reporting (Kolk, 2008; KPMG/UvA, 2005), which analyzed the trend in sustainability reporting among the top 250 of the Fortune Global 500 companies, it appears that one-third of the sampled firms resort to external verification of their report. Hasan *et al.* (2005) indicate in a survey that assurance on environmental performance is the most frequently provided assurance service with respect to non-financial information, with most respondents characterizing them at a moderate level of assurance engagement. In a survey funded by CPA Australia investigating

current practices relating to the provision of sustainability assurance statements, Deegan et al. (2006) recently found that there is great variability in the presentation format and contents of these type of assurance statements, both within particular regions and internationally across European countries. The study also indicated how various types of entities are currently involved in providing third-party assurance, as they comprise accounting firms, environmental consultants, management consultants and non-governmental organizations. A recent paper by Mock *et al.* (2007) examined a sample of 130 firms worldwide that issued a sustainability report between 2002 and 2004. Their analysis suggested that different characteristics inherent to the level of assurance provided are positively associated to the type of assurance provider, lending support to higher level of expertise in non-financial assurance by larger auditing firms in comparison with other types of assurance providers. Overall, the current absence of an agreed set of standards reduces the comparability of assurance statements and causes significant variation between countries in the type of assurance provided. Moreover, there are no generally accepted approaches to how a company should collect, evaluate and report its nonfinancial performance data. As documented by Park and Brorson (2005) in a sample of 28 Swedish companies, the assurance process is often company-specific and the time span of the actual steps varies depending on the objective and the scope of the assurance engagement.

Consistent with these practical developments, most prior academic studies on assurance practices in the sustainability area can be found in the social and environmental accounting literature that mainly addressed the issue of credibility of sustainability assurance provision (see Adams and Evans, 2004). Several researchers have been critical of key features of emerging practices in this area, given the absence of established auditing standards and its tendencies towards 'managerial capture' at the expense of accountability and transparency to external audiences and stakeholders groups (see, for example, Adams, 2004; Cooper and Owen, 2007; Dando and Swift, 2003; Gray, 2002; Gray and Bebbington, 2000; Gray and Collison, 2002; O'Dwyer, 2003; Power, 1997). Fundamental concerns have been raised by empirical papers over crucial aspects of sustainability assurance (see Deegan *et al.*, 2006 for a recent review), such as assessor independence in the verification assessment (Ball *et al.*, 2000a), major inconsistencies regarding scope of assurance, criteria employed and levels of assurance provided (Kamp-Roelands, 2002), and a general absence of stakeholder participation during the assurance process (O'Dwyer and Owen, 2005).

While we acknowledge the relevance of understanding and improving the credibility, value and communication of current sustainability assurance statements, the objective of this paper is to investigate the factors associated with the adoption of sustainability assurance statements. Since the market for assurance services in general is in its formative stages, though evolving rapidly, we have a very limited understanding of the nature and extent of the voluntary demand of this novel auditing practice (Hasan *et al.*, 2005; Jamal *et al.*, 2003). Prior research in auditing focused on individual user perception of the assurance statements accompanying both financial reports (refer to Hasan *et al.*, 2005 for an overview) as well as special purpose reports (Coram and Monroe, 2004; e.g. Hunton *et al.*, 2000; Srivastava and Mock, 2000). In this study, we focus instead on the role of country-level institutional factors to explain the voluntary demand of sustainability assurance services, using a longitudinal research design in a cross-national context.

THEORY AND DEVELOPMENT OF HYPOTHESES

As the review of prior research suggests, a firm's decision to have its (sustainability) report voluntarily assured is driven by its incentives to improve the credibility and transparency of the (social and environmental) information disclosed. Since independent assurance is a costly mechanism, it can be argued that the choice to have a report assured is more likely among firms for which the organizational benefits are greater, both in terms of reduced agency costs and increased user confidence of the accuracy of the information reported (Carey *et al.*, 2000). A similar line of reasoning and empirical explanation can be derived from the accounting studies that examined the determinants of voluntary environmental reporting (see e.g. Berthelot *et al.*, 2003; Brammer and Pavelin, 2006; Brown and Fraser, 2006; Cormier *et al.*, 2005; Lee and Hutchison, 2005).

Our focus in this paper is restricted to three country-level factors that are likely to affect a firm's voluntary adoption choice of an assurance statement for its social and environmental report. Our interest is in the extent to which selected country-level variables either facilitate or hinder the decision of a firm to have its sustainability report assured. We draw on recent accounting and finance literature that examined the choice of auditing and assurance practices, using various cross-country comparative studies (cf. Doidge *et al.*, 2004; Durnev and Kim, 2005). This line of enquiry notes that national legal environments are key determinants of financial market developments, corporate ownership structures and the properties of auditing procedures around the world (Choi *et al.*, 2008; Choi and Wong, 2007; Francis *et al.*, 2007). In particular, Francis *et al.* (2007) provide evidence that the choice of a voluntary audit is fundamentally shaped by broader country-level institutions. An implication of this view is that firm incentives for better monitoring and governance structures (including auditing) are less likely to matter in absence of specific legal infrastructure and enforcement mechanisms.

By extension, in this study we posit that the voluntary adoption of assurance statements is fundamentally endogenous to broader country-level factors, such as legal systems and other institutional arrangements. While controlling for firm- and industry-level effects, our empirical prediction is that country-level variables will be significant determinants of the demand of sustainability assurance. The choice of the selected country-level determinants for this study takes into account findings from prior research, as well as constraints concerning the availability of empirical data. We will discuss each of these determinants and develop testable hypotheses in turn.

1. The role of the legal environment

The first country-level determinant refers to the legal environment in which a firm is domiciled, by acknowledging the difference between common law versus code law legal systems as a valid proxy for the extent of market relative to political determination of corporate reporting (cf. Ball *et al.*, 2000b; LaPorta *et al.*, 1997). Briefly stated, in common law countries ('shareholder model' or contractarian system building on the theory of the firm by Coase) shareholder wealth maximization is the primary purpose of the corporation. In such a business and legal environment, the role of other stakeholder groups is less emphasized. Prior research in accounting indicate that in this legal system firms deal with investors at 'arms length' and an increased demand for information on a firm's financial performance can be expected (Ball *et al.*, 2000b; Jaggi and Lee, 2000). In code law countries ('stakeholder model' or communitarian system), a corporation is considered an organization that has social

responsibilities that go beyond achieving economic efficiency. A corporation is accorded legal status by the society in which it operates and in turn is expected to fulfil certain social responsibilities. In contrast to the contractarian viewpoint, firms in the communitarian perspective have social responsibilities not only towards their shareholders but towards all their stakeholders. Prior studies in accounting literature conclude that there is an increasing number of insider owners, such as banks and other institutional investors, who get their information directly from management (Ball *et al.*, 2000b; Jaggi and Lee, 2000).

Several studies have attempted to demonstrate a country effect in examining the voluntary disclosure of environmental information at international level. For instance, Meek, Roberts and Gray (1995) examined factors affecting disclosures (including social and environmental information) contained in annual reports of multinational corporations from the United States, the United Kingdom, and continental Europe. They found that national/regional influences are important factors explaining voluntary, non-financial information disclosures. Fekrat, Inclan and Petroni (1996) examined environmental disclosures in 1991 annual reports of 168 companies from 18 countries. They found significant variations in corporate environmental disclosures among companies from different countries. More recently, Smith, Adhikari and Tondkar (2005) provide evidence that firms from countries with a stakeholder orientation (Norway and Denmark) show higher levels and quality of their corporate environmental and social reports than firms from countries with a weaker emphasis on social issues (United States) and thus a shareholder orientation. In line with prior arguments and results, we expect a higher demand of assurance services of firms domiciled in code law countries compared to common law countries. It can be posited that management in stakeholder-oriented societies are more likely to adopt independent assurance of disclosed social and environmental information as part of strategically managing stakeholder relationships. We thus empirically predict the following:

- H1.** The probability of adoption of an assurance sustainability statement is positively associated to countries with a legal system based on code law rather than common law.

2. The role of enforcement mechanisms

Following a recent stream of auditing papers investigating auditor's governance function in cross-country comparisons (e.g. Choi and Wong, 2007; Fan and Wong, 2005; Francis *et al.*, 2007), it can be argued that the quality of a national legal environment affects the provision of auditing and assurance services. A distinction is usually made between countries characterized by weak vs. strong legal and enforcement mechanisms, with the underlying assumption that independent audits facilitate contracting by reducing information asymmetry and monitoring the performance of the contracting parties. Two competing predictions from this stream of literature can be posited. On the one hand, Ball (2001) suggests that in countries without a strong legal infrastructure, the role of accounting and auditing in contracting is minimal and other institutional mechanisms become more important. By extension, the role of assurance services for sustainability could be hindered in a country with a weak legal environment due to a lack of credibility.

On the other hand, findings by Durnev and Kim (2005) and Choi and Wong (2007) indicate that governance mechanisms, such as having an independent audit or assurance, can serve as a substitute for absent or weak country-level institutions that constrain the behaviour of contracting parties. They argue that, in countries with stronger legal systems and other

institutions, a firm has less to gain from independent audits because existing country-level institutions impose constraints on contracting parties and may therefore provide sufficient protection. The empirical prediction that emerges under this view is that the voluntary demand for auditing is greater in countries with weaker legal regimes because auditing serves as a substitute for the absence of other institutions that facilitate private contracting. In addition, when litigation risks are sufficiently low in presence of weak enforcement mechanisms, auditing services may become more affordable since the benefits of auditors of acquiescing to clients outweigh the potential penalties.

Our view in this paper similarly contends that the demand for assurance is strengthened in institutional environments where the quality of a national legal environment is weaker. It is therefore expected that assurance services fulfil a substitute role in ensuring control over the credibility and quality of disclosed social and environmental information, thereby reducing the risks of lack of compliance that shareholders and stakeholders can arise against a firm's management. Accordingly, we hypothesize the following:

- H2.** The probability of adoption of an assurance sustainability statement is positively associated to countries with weaker enforcement mechanisms.

3. The role of institutional factors

From a stream of studies in environmental accounting, it appears that the choice of disclosure depends on how companies respond to public pressures exerted by various stakeholders and constituencies (cf. Berthelot *et al.*, 2003). Public pressure in the social/political environment is identified as consisting of both social changes and regulatory effects. Thus, public pressure can arise because of the concerns of the general population, political bodies or regulatory agencies (Walden and Schwartz, 1997). Researchers in this area extensively refer to legitimacy theory, claiming that organizations have implicit contracts with society and fulfilling these contracts legitimates the organizations and their operations (cf. Brown and Fraser, 2006; Deegan, 2002). According to this theory, differences in public policy and institutional pressures lead to differences in the extent to which companies disclose information about their social and environmental performance. As a result, changes in pressures lead to changes in the extent of environmental disclosure (cf. Cormier *et al.*, 2004; Milne and Patten, 2002 for detailed reviews of legitimacy theory).

Several empirical studies have provided evidence of increased environmental disclosure in response to amplified public policy pressures, with some studies using a longitudinal approach of one company or industry (see Alciatore *et al.*, 2006 for recent reviews; Deegan *et al.*, 2002; Lee and Hutchison, 2005). For instance, Patten (1992) used legitimacy theory to explain changes in environmental disclosures by North American oil companies after the Exxon Valdez oil spill. As expected, the oil spill represented a threat to the reputation associated to the industry and forced oil companies to increase environmental disclosures in their annual reports in the period subsequent the environmental disaster. Other studies examine variation in environmental reporting across a sample of companies located in a specific country. In the Australian context, for example, Deegan and Gordon (1996) found that companies' environmental reporting was positively related to the increase of environmental interest groups.

In line with these arguments, we expect that firms domiciled in countries with a higher pressure towards corporate sustainability due to public policy and institutional factors will be more likely to have their report externally verified by an assurance provider. In this study, the

demand for sustainability associated to a country is proxied by an aggregate variable that captures a variety of institutional and market mechanisms. It is assumed that corporations operating in national environments that enable higher levels of corporate sustainability will engage more in assurance services to respond to a higher demand of transparency and accountability. Following from the above discussion, it is hypothesized that:

H3. The probability of adoption of an assurance sustainability statement is positively associated to countries with a higher pressure for corporate sustainability.

METHODOLOGY AND DATA

Model specification and variable measurement

We posit the following pooled logistic regression model for sample firms i and country j to test the hypotheses previously developed.

$$AST_{it} = \alpha + \beta_1 LEG_j + \beta_2 ENF_j + \beta_3 RESP_j + \beta_4 SIZE_{it} + \beta_5 CAP_{it} + \beta_6 OILCHEM_i + \beta_7 PROD_i + \beta_8 UTI_i + \beta_9 FIN_i + \text{fixed year effects} + \text{error term}$$

The dependent variable AST used in the logistic regression (logit) model is restricted to the subsample of firms that have a sustainability report and takes the value of 0 in case of lack of assurance or the value of 1 for assured statements. The definitions of the independent and control variables and a summary of the hypotheses tested are presented in Table 1.

[Insert Table 1 about here]

LEG is a dummy variable denoting whether a country belongs to a common versus code law legal system using the widely used classification provided by La Porta *et al.* (1997). The index ENF is a modified index by Choi and Wong (2007) from La Porta *et al.* (1997) intended to capture the quality of a legal environment. Further, $RESP$ measures the National Corporate Responsibility Index computed by AccountaAbility (2005) as one of the only available indices that attempts to capture variation in country regimes with respect to a broad range of social and environmental-related institutional factors. Table 2 reports the indexes of the country-level variables used for this study.

Two firm-level variables are included to control for corporate visibility to social and environmental issues consistently with prior research in environmental accounting and disclosure (cf. Berthelot *et al.*, 2003; Bewley and Li, 2000; Brammer and Pavelin, 2006; Lee and Hutchison, 2005). $SIZE$ measures the natural log of a firm's revenues. We additionally compute the variable CAP as the natural log of assets per employees to capture the pollution propensity of a firm. Finally, we control for industry effects with four dummy variables. Oil, gas and chemicals ($OILCHEM$), utilities (UTI) and manufacturing ($PROD$) companies tend to be more exposed to environmental and social risks and therefore might be more inclined to have a sustainability report assured. Also companies in the financial sectors (FIN) are controlled for, given the increased demand of accountability and credible information by stakeholder groups in this industry.

Two variables are further included for descriptive purposes and exploratory analysis. REP is a dummy variable measuring the availability of a firm's social, environmental or sustainability report. AUD takes the value of 0 where the assurance provider is not a major

accounting (i.e. a Big-6¹) firm, and the value of 1 in case assurance is provided by a major accounting firm.

Since we test our hypotheses with panel data that involve repeated observations on the same set of cross-sectional units, we run a pooled cross-sectional logistic regression model with fixed effects for calendar years (see Yor and Leblebici, 2005 for a similar approach with interrupted yearly observations). Fixed-effect regressions control for both the unobserved year effects, and help minimize the problem of heteroscedasticity and autocorrelation. Because the number of observations varies across countries, we use weighted least squares regression models in order to weight each country equally (Cohen *et al.*, 2003, p.309).

Sample and descriptive analysis

The sample for this study is a panel of companies over the years 1999, 2002 and 2005. We selected the first half of the Fortune's Global 500 list as published on 3 August 1998, and took this same set in 2002 and 2005. Our final panel amounted to 636 firm-year observations, taking into account the companies that were subject to mergers and acquisitions, and 'survived' over a seven-year time span (for more details about the sample, see Kolk, 2003; Kolk, 2005; KPMG/UvA, 1999, 2002, 2005).

The Fortune Global 250 firms listed were approached and requested to send their most recent environmental, social, and/or sustainability report. This could be either a separate report or, if not available, a copy of the annual financial report if it contained this kind of information (also called 'integrated report'). Websites were visited to actively search for reports, and if this did not yield results, the companies were contacted, several times if necessary, by letter, mail and /or phone, in order to have certainty about reporting for the whole sample.

[Insert Tables 2-4 about here]

Tables 2-4 summarize the observations respectively per country, per year and per industry. The panel of 212 firms comprises most companies from the United States (33.0%), Japan (22.6%), Germany (9.9%), France (8.5%) and the United Kingdom (6.1%). Statistics indicate that the adoption of environmental, social, and/or sustainability report in the panel was highest in Japan (89 reports in total), followed by the United States (78), Germany (41), the United Kingdom (35) and France (27). Assurance statements were most frequent in the United Kingdom (28 statements), followed by Japan (15), The Netherlands (10), and Germany, Italy and Switzerland (8). Remarkably, only 5 assurance statements (6.4% of the reports available) accompanied a report disclosed by companies located in the United States.

As displayed in Table 3, a total of 341 environmental, social, and/or sustainability reports were published in the period examined. Companies issuing a report increased from 39.6% to 68.9% in our panel. The percentage of assurance statements accompanying these reports increased from 1999 to 2002 (from 21.4% to 31.5%), and remained about the same in 2005 (30.8%). A total of 98 assurance statements are identified in our panel. Among the assurance providers, the relative number of Big-6 accounting firms shows a growing trend

¹ The Big-6 auditing firms were the largest international accountancy and professional services firms in the period 1989-1998. These firms comprised Arthur Andersen, Coopers & Lybrand, Deloitte & Touche, Ernst & Young, KPMG and Price Waterhouse. The Big-6 became the Big-5 in July 1998 when Price Waterhouse merged with Coopers & Lybrand to form PricewaterhouseCoopers. Arthur Andersen was convicted of obstruction of justice in the wake of the 2001 Enron scandal and most of its country practices around the world were sold to members of what is currently the Big-4.

from 61.1% in 1999 to 65.7% in 2002. The data about 2005 show a declining market share of assurance engagements by Big-6 accounting firms (53.3% compared to three years before). It is worth noticing that 8 cases occurred (8.2%) in which the same company that issued a report with an assurance statement in a year decided not to provide an assurance statement in the subsequent year. The number of switches from Big-6 to non-Big-6 assurance providers occurred only 5 times in the total panel, thereby suggesting a rather established relationship between companies and independent assurance providers.

Table 4 presents summary statistics per industry. The data indicates that 41% of firms in the oil & gas and chemical sectors accompany a sustainability report with an independent assurance statement. Only 12.1% of the manufacturing firms that produce a report choose to have it verified by an independent assurance provider.

[Insert Table 5 about here]

From the pooled correlation matrix of the variables presented in Table 5, it appears that the correlations among firm- and country-level variables included in our specification model are relatively low (with the highest significant Pearson correlation of 0.759 between *ENF* and *RESP* and a correlation of 0.457 between *LEG* and *ENF*), thus suggesting that multicollinearity is not likely to be a serious concern in the estimation of the logistic regression model.

It is worth noticing that the correlations among *AST* and the country-level predictors are in the expected direction, though only the correlation with *LEG* is significant. The variable *AUD* is negatively correlated with *LEG*, and *LIT*, meaning that the extent to which firms adopt sustainability assurance services is on average lower in common law countries and in legal environments characterized by higher levels of litigation. As expected, the variable *ENF* and *LIT* are highly positively correlated, thereby lending support to the use of *ENF* for our predictive model being applied to a higher number of countries.

RESULTS

Table 6 reports the results of logistic regression models with fixed effects (2 year dummy variables) included. The analysis comprises only those firms that have issued a social, environmental or sustainability report (N=341), since the model aims at predicting the likelihood of an assurance statement that accompanies a report. The logistic regression model is significant with a Wald Chi-square of 59.76 ($p < 0.000$) and a Pseudo R^2 of 20%.

With respect to our variables of interest, the coefficient of *LEG* is negative and significant ($p = 0.000$, two-tailed). The results thus corroborate H1 since firms domiciled in common law (stakeholder-oriented) countries are more likely to have their sustainability reports assured compared to firms domiciled in code law (shareholder-oriented) countries. Further, the coefficient of *ENF* is negative and significant ($p = 0.000$, two-tailed), suggesting that the likelihood of adoption of an assurance statement is higher for firms residing in countries with a weaker enforcement mechanisms. We can therefore accept H2 and confirm the intuition behind prior studies that auditing services fulfil a substituting role in ensuring control over the credibility of disclosed information. Finally, the analysis shows a positive coefficient of *RESP* ($p = 0.000$, two-tailed). As predicted in H3, the probability of adoption of an assurance sustainability statement is positively associated to countries with a higher institutional pressure for corporate sustainability.

[Insert Table 6 about here]

The results indicate that among the control variables only *OILCHEM* and *PROD* show a significant coefficient. The firm-level variables *SIZE* and *CAP* appear not significantly associated with the decision to have a sustainability report assured. Similarly, the analysis confirms that the percentage of firms with assured sustainability reports is not significantly increasing when comparing the observations in 2002 ($p=0.117$) with 2005 ($p=0.197$).

Since inferences from the tests of our predictions might be affected by data and model specifications, we performed a series of tests for robustness check. First, we repeat our analysis per year instead of using year dummies in a pooled logistic regression model. The results of our hypothesis tests presented in Table 6 remain qualitatively unchanged. We additionally performed the same pooled regression model without year dummies and obtained results still consistent with the ones reported in Table 6. Second, to address a potential problem due to a large number of observations for firms located in the United States compared to other countries, we repeated the analysis after sequentially excluding companies located in the United States from the panel. The results are qualitatively unchanged when compared to the results reported using weighted least squares regression. Third, we acknowledge that the decision of a firm to assure a sustainability report is conditional upon the decision of issuing a report in first place. We tested this combined decision using an ordered probit regression model with a dependent variable that assumes the value of 0 for firms not issuing a sustainability report, a value of 1 for firms issuing a report, and a value of 2 for firms that accompany a report with an assurance statement ($N=636$). The main results (not reported here) remain unchanged, indicating the robustness of our findings even when the voluntary decisions to issue a sustainability report and to have it assured are examined in combination.

As additional analysis, we were interested to examine whether the same factors posited as determinants of assurance statements were significantly related to the choice of an accounting firm as the assurance provider. A logistic regression model with *AUD* as dependent variable was therefore analyzed for exploratory purposes. The results including the subsample of firms with an assurance statement ($N=98$; results are not reported here) show that the only control variables *SIZE* and *FIN* are significantly predicting whether a firm seeks assurance from the auditing profession instead of other assurance providers. Country-level factors are not significant determinants of the decision to have a report independently verified by a large accounting firm as assurance provider. We subsequently substituted the variable *ENF* with another proxy for the litigation regime enforced in a country (*LIT*) developed by Wingate (1997). Since the available country-level data for this proxy is limited, the sample for this analysis decreased to $N=44$ observations. The exploratory findings with a reduced sample indicate that the likelihood that an assurance statement will be issued by a Big-6 accounting firm is negatively related with the strictness of a country legal regime. Results also show that the likelihood to choose a large accounting firm as assurance provider increases for companies domiciled in common law countries, thus more shareholder-oriented. The variable *SIZE* is the only control variables in the logistic model that is significant, suggesting thus that the likelihood of choosing a large accounting firm as assurance provider is higher for bigger firms that can sustain higher audit fees.

CONCLUSIONS AND DISCUSSION

This paper examined the determinants of the adoption of sustainability assurance statements. We identified a set of factors at country-level that can be expected to significantly

predict a firm's choice of this novel form of assurance service. Using an international panel of multinationals included in the Fortune Global 250 list, we provide evidence of the adoption of sustainability assurance in reports published in the years 1999, 2002 and 2005. Figures suggest that approximately one-third of the reports issued in the panel examined is accompanied by a third-party assurance statement. Our data points at a slightly declining role of accounting firms in this area, due to the increased amount of engagements through alternative assurance providers. Our descriptive analysis shows that companies located in Europe and in Japan produce the highest number of verified sustainability reports, not only in traditional manufacturing industries that are more environmentally sensitive but also in the banking and insurance sector. This confirms what has been found in earlier studies (e.g. Kolk, 2005; 2008; KPMG, 2005). The relatively low percentage of reports with assurance statements for US companies, particularly when compared to Europe and to Japan to a less extent, has been explained from the compliance orientation related to the litigious tradition in the US (Kolk, 2005). The UK stands out for its traditionally high levels of reporting and assurance – already in the mid-1990s, 44% of non-financial reports was externally verified (KPMG, 1996, p. 11). This has been linked to regulatory encouragements and societal pressures as they have evolved over the years (Adams et al., 1998; Kolk, 2005).

From the results of the predictive model, it appears as expected that firms domiciled in stakeholder-oriented countries are more likely to have a sustainability report assured. We also find strong evidence that the voluntary demand of assurance services in this area is significantly influenced by the legal environment in which a firm operates. Our results are consistent with the notion that auditing and governance mechanisms can act as substitute for absent or weak country-level institutional mechanisms. It appears nevertheless that the decision to adopt a sustainability assurance service depends on the level of awareness about sustainability present in a country. Our findings appear to be robust across various model specifications.

This study adds to the limited prior descriptive evidence in the area of sustainability assurance (cf. Deegan *et al.*, 2006; O'Dwyer and Owen, 2005) and contributes to the literature on the adoption of voluntary non-financial assurance services (Hasan *et al.*, 2005). The set of country-levels factors drawn from extant accounting, auditing and governance literature represents an initial attempt to systematically evaluate the drivers of assurance practices in an international context. The substantial lack of data availability in the area of corporate sustainable management represents a severe practical constraint to extend the investigation to additional explanatory factors, particularly because the collection of data is hindered when the nature of the sample requires data from different countries for multiple periods. Limitations of this study stem therefore from both the nature of the sample and the data examined. Further research could replicate the theoretical framework that this study has developed with larger samples (including smaller and non-listed companies) and along an extended time span. Despite the limitations inherent to the research methodology, the findings from our predictive model do allow exploratory conclusions that certainly warrant future investigations. We suggest three directions of research in the area of sustainability assurance that have relevant academic and practical implications.

First, there is a need to refine the theoretical framework of determinants investigated in this study, by considering additional firm- and country-level drivers of sustainability assurance services. For instance, different corporate governance arrangements could be investigated at firm-level to assess their ability to explain variation in sustainability assurance demand. Data about the formal inclusion of social and environmental accountability lines at the board and executive level could be derived from publicly available corporate disclosures,

and added as theoretically meaningful predictors in the current logistic regression model. Similarly, it would be interesting to empirically examine the diffusion of assurance services in relation to a firm's social and environmental performance and stakeholders' pressures. In addition, different country-level predictors could be alternatively explored. Future research should specifically analyze the differential impact of judicial and regulatory regimes in the social and environmental arena, in combination with the adoption of voluntary sustainability assurance services standards issued by national accounting bodies (FEE, 2006).

Such research would contribute to comparative approaches aiming at elaborating a detailed predictive framework for national systems of corporate social responsibility (e.g. Matten and Moon, 2008). However, to what extent our findings on assurance fit in Matten and Moon's implicit-explicit (respectively Europe-US) distinction can be doubted, as voluntary reporting and assurance, while showing clearly different patterns between the two regions, seem to rely on corporate discretion and societal expectations in a somewhat different way than they outlined. Our paper does not confirm the bases of their differentiation, as European companies do use the language of CSR to communicate, via reports, to their stakeholders and they also, via assurance, show a practice that results from a deliberate and voluntary decision, which may reflect stakeholder expectations at the same time.

Interesting aspects to investigate as well include the extent to which individual-level executives' characteristics (e.g. professional background or personality traits that denote an inclination towards sustainability issues) act as significant drivers of sustainability assurance engagement (Crawford, 2007). As suggested by Park and Brorson (2005), field research on the interaction among report preparers, assurance providers and stakeholders is also warranted to better understand how the process of assurance engagement takes place and eventually affects the credibility of third-party assurance.

Second, future research should examine the quality of sustainability assurance statements rather than merely their adoption. A methodology based on content analysis to evaluate assurance quality levels is readily available from the protocol developed in O'Dwyer and Owen (2005). Their framework identifies the minimum requirements of a high quality assurance statement in conformity to extant international guidelines (AccountAbility, 2003b; FEE, 2006; IAASB, 2003). In absence of clear standards in this area, this line of investigation appears timely and necessary for the accounting policy makers and practitioners' community to ensure higher levels of reliability, comparability and homogeneity of current assurance provision on sustainability reports. In particular, the effects of alternative assurance providers (e.g. accounting firms, environmental consultants and NGOs) on the quality of assurance statements would be another research area of great value to both scholars and practitioners. Finally, future studies would need to consider whether the introduction of mandatory standards in this area may bring about the necessary progress in assurance quality, particularly in terms of stakeholder engagement and accountability (Cooper and Owen, 2007; Dando and Swift, 2003).

Third, the role of financial intermediaries with respect to sustainability information provision is increasing and reflect a transformation currently occurring in the institutional investment community (cf. Solomon and Solomon, 2006). Growing attention is in particular directed towards so-called Socially Responsible Investing (SRI) initiatives (EUROSIF, 2003; SIF, 2003; The Global Compact, 2004), with ranking indexes like the *Dow Jones Sustainability Index* and the *FTSE4Good Index* as attempts to integrate social and environmental information into mainstream investment decisions. In a similar vein, Goldman Sachs recently launched a private *Environmental, Social and Governance (ESG) Index* to support analysts in ranking companies along five distinct CSR performance dimensions. A

2003 survey published by CSR Europe, Deloitte and Euronext (2003) reveals that social and environmental performance is on course to become a significant aspect of mainstream investment decisions. It is becoming clear that the financial community sees a direct link between non-financial risks and shareholder value: eight out of ten fund managers and analysts believe that the management of social and environmental risks has a positive impact on a company's market value in the long-term. Further research is needed to better understand how analysts react to the provision of assurance services in supplementing investment decisions based purely on financial information. It would be particularly useful to actively involve financial analysts in controlled experimental studies to assess alternative reactions to investment decision tasks following a manipulation of sustainability assurance engagements (e.g. Belkaoui, 1980; Chan and Milne, 1999; Milne and Chan, 1999; Rikhardsson and Holm, 2008). Such a research method would gain insights in the behavioural implications associated with the use of sustainability-related information by the financial community.

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Table 1 – Variable definitions

Variable (acronym)	Definition (source)	Hypothesis (sign)
Dependent variable		
<i>Sustainability assurance statement (AST)</i>	Indicator variable equals 1 if an environmental, social & environmental or sustainability annual report for firm <i>i</i> in year <i>t</i> is accompanied by an assurance statement, and 0 otherwise (KPMG/UvA 1999, 2002, 2005).	
Independent variables		
<i>Legal origin (LEG)</i>	Indicator variable equals 1 for common law country <i>j</i> , and 0 for code law countries from La Porta <i>et al.</i> (1997).	H1 (–)
<i>Enforcement (ENF)</i>	Quality of a country's <i>j</i> legal environment measured by Choi and Wong (2007) as a modified index from La Porta <i>et al.</i> (1997).	H2 (–)
<i>Responsibility Index (RESP)</i>	National Corporate Responsibility Index (NCRI) measured by AccountAbility for a country <i>j</i> in 2005.	H3 (+)
Control variables		
<i>Firm size (SIZE)</i>	Natural log of a firm's <i>i</i> revenues in year <i>t</i> (Compustat).	
<i>Capital intensity (CAP)</i>	The magnitude of a firm's <i>i</i> capital investment, measured by the natural log of amount of assets per employee in year <i>t</i> (Compustat).	
<i>OILCHEM</i>	Indicator variable equals 1 for firm <i>i</i> in oil & gas and chemical sector, and 0 otherwise (KPMG/UvA 1999, 2002, 2005).	
<i>UTI</i>	Indicator variable equals 1 for firm <i>i</i> in utilities sector, and 0 otherwise (KPMG/UvA 1999, 2002, 2005).	
<i>PROD</i>	Indicator variable equals 1 for firm <i>i</i> in manufacturing sector, and 0 otherwise (KPMG/UvA 1999, 2002, 2005).	
<i>FIN</i>	Indicator variable equals 1 for firm <i>i</i> in banking and insurance sector, and 0 otherwise (KPMG/UvA 1999, 2002, 2005).	
Additional variables		
<i>Sustainability report (REP)</i>	Indicator variable equals 1 if a firm <i>i</i> in year <i>t</i> issued an environmental, social & environmental or sustainability annual report, and 0 otherwise (KPMG/UvA 1999, 2002, 2005).	
<i>Accounting assurance provider (AUD)</i>	Indicator variable equals 1 if the assurance provider for a firm <i>i</i> in year <i>t</i> is a Big-6 auditor, (Arthur Andersen, Coopers & Lybrand, Deloitte & Touche, Ernst & Young, KPMG, PriceWaterhouse), and 0 otherwise (KPMG/UvA 1999, 2002, 2005).	
<i>Litigation (LIT)</i>	Strictness of a country's <i>j</i> legal regime measured by the natural log of the Wingate's (1997) litigation index.	

Table 2 – Summary statistics per country

Country	(a)	(b)	(c)	(d)	(e)	(f)	(g)	<i>LEG</i>	<i>ENF</i>	<i>RESP</i>	<i>LIT</i>
Australia	2	0.9%	4	1.2%	3	3.1%	75.0%	1	10.00	68.10	10.00
Belgium	1	0.5%	1	0.3%	0	0.0%	0.0%	0	10.00	66.70	n.a.
Brazil	2	0.9%	4	1.2%	0	0.0%	0.0%	0	6.32	56.40	n.a.
Canada	1	0.5%	1	0.3%	0	0.0%	0.0%	1	10.00	67.10	n.a.
China	2	0.9%	0	0.0%	0	0.0%	0.0%	n.a.	n.a.	48.80	n.a.
France	18	8.5%	27	7.9%	5	5.1%	18.5%	0	8.98	65.30	n.a.
Germany	21	9.9%	41	12.0%	8	8.2%	19.5%	0	9.23	68.00	n.a.
Italy	5	2.4%	11	3.2%	8	8.2%	72.7%	0	8.39	56.90	6.22
Japan	48	22.6%	89	26.1%	15	15.3%	16.9%	0	8.98	65.20	n.a.
Mexico	1	0.5%	2	0.6%	2	2.0%	100.0%	0	5.35	52.40	n.a.
The Netherlands	7	3.3%	18	5.3%	10	10.2%	55.6%	0	10.00	68.30	n.a.
Norway	1	0.5%	3	0.9%	3	3.1%	100.0%	0	10.00	67.30	6.22
Russia	1	0.5%	2	0.6%	0	0.0%	0.0%	0	n.a.	48.30	n.a.
South Korea	6	2.8%	2	0.6%	0	0.0%	0.0%	0	5.35	58.60	n.a.
Spain	2	0.9%	4	1.2%	3	3.1%	75.0%	0	7.80	61.90	n.a.
Sweden	2	0.9%	5	1.5%	0	0.0%	0.0%	0	10.00	73.50	4.82
Switzerland	6	2.8%	14	4.1%	8	8.2%	57.1%	0	10.00	70.70	n.a.
United Kingdom	15	6.1%	35	10.3%	28	28.6%	80.0%	1	8.57	69.00	10.00
United States	70	33.0%	78	22.9%	5	5.1%	6.4%	1	10.00	67.50	15.00
Venezuela	1	0.5%	0	0.0%	0	0.0%	0.0%	0	n.a.	46.40	n.a.
<i>Total</i>	212	100%	341	100%	98	100%					

Variable definitions are provided in Table 1. Column (a) exhibits the firms per country in the panel (N=212). Column (b) exhibits the proportion of firms per country. Column (c) exhibits the number of firms per country that issue a social, environmental or sustainability report (*REP*) in the panel (N=341). Column (d) exhibits the proportion per country of total *REP*. Column (e) exhibits the number of firms per country that assure a social, environmental or sustainability report (*AST*). Column (f) exhibits the proportion per country of *AST* in the panel (N=98). Column (g) exhibits the proportion of *AST* on *REP* per country.

Table 3 – Summary statistics per year

Year	(a)	(b)	(c)	(d)	(e)	(f)
1999	84	39.6%	18	21.4%	11	61.1%
2002	111	52.4%	35	31.5%	23	65.7%
2005	146	68.9%	45	30.8%	24	53.3%
<i>Total</i>	341		98		58	

Variable definitions are provided in Table 1. Column (a) exhibits the number of firms in the panel issuing a social, environmental or sustainability (*REP*) per year. Column (b) exhibits the proportion of *REP* on total *REP* per year. Column (c) exhibits the number of firms in the panel issuing an assurance statement (*AST*) per year. Column (d) exhibits the proportion of *AST* on the total assurance statements issued per year. Column (e) exhibits the number of assurance statements issued by a Big-6 accounting firm (*AUD*) per year. Column (f) exhibits the proportion of *AUD* on the total assurance statements issued per year.

Table 4 – Summary statistics per industry

Industry	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Oil & Chemicals (<i>OILCHEM</i>)	104	16.4%	78	75.0%	32	32.7%	41.0%
Utilities (<i>UTI</i>)	30	4.7%	24	80.0%	5	5.1%	20.8%
Manufacturing (<i>PROD</i>)	124	19.5%	99	79.8%	12	12.2%	12.1%
Banks & Insurance (<i>FIN</i>)	164	25.8%	59	36.0%	23	23.5%	30.9%
Others	214	33.6%	81	37.9%	26	26.5%	32.1%
<i>Total</i>	636	100%	341		98	100%	

Variable definitions are provided in Table 1. Column (a) exhibits the firms per industry. Column (b) exhibits the proportion of firms per industry. Column (c) exhibits the number of firms that issue a social, environmental or sustainability report (*REP*) per industry. Column (d) exhibits the proportion of *REP* per industry. Column (e) exhibits the number of firms that assure a social, environmental or sustainability report (*AST*) per industry. Column (f) exhibits the proportion of total *AST* per industry. Column (g) exhibits the proportion of *AST* on *REP* per industry.

Table 5 – Descriptive statistics and correlation matrix

	Mean	S.D.	<i>AST</i>	<i>LEG</i>	<i>ENF</i>	<i>RESP</i>	<i>SIZE</i>	<i>CAP</i>	<i>OIL CHEM</i>	<i>UTI</i>	<i>PROD</i>	<i>FIN</i>	<i>REP</i>	<i>AUD</i>	<i>LIT</i>
<i>AST</i>	0.15	0.36	1.000												
<i>LEG</i>	0.41	0.49	-0.090*	1.000											
<i>ENF</i>	9.26	0.97	-0.064	0.457**	1.000										
<i>RESP</i>	66.02	3.85	0.051	0.372**	0.759**	1.000									
<i>SIZE</i>	24.22	0.64	0.075	-0.006	0.077	0.068	1.000								
<i>CAP</i>	13.59	1.59	0.039	0.088*	-0.056	-0.022	0.093	1.000							
<i>OILCHEM</i>	0.16	0.37	0.188**	0.047	-0.049	-0.086	-0.020	-0.131**	1.000						
<i>UTI</i>	0.05	0.21	0.008	-0.095	-0.019	-0.149**	-0.024	0.038	-0.098	1.000					
<i>PROD</i>	0.20	0.40	-0.008	-0.144**	0.014	0.058	0.106**	-0.299**	0.040	-0.109**	1.000				
<i>FIN</i>	0.26	0.44	-0.023	-0.007	0.016	0.061	0.009	0.776**	-0.261**	-0.131**	-0.290**	1.000			
<i>REP</i>	0.54	0.49	0.397**	-0.179**	0.002	0.107**	0.174**	-0.100	0.190**	0.118**	0.259**	-0.209**	1.000		
<i>AUD</i>	0.59	0.29	0.742**	-0.098*	-0.068	-0.002	0.131**	0.049	0.155**	0.058	-0.046	-0.024	0.295**	1.000	
<i>LIT</i>	13.25	3.12	-0.590**	0.763**	0.718**	0.244**	-0.020	-0.049	-0.065	-0.068	-0.044	0.007	-0.351**	-0.508**	1.000

Variable definitions are provided in Table 1.

**Pearson correlations significant at the 1% level (two-tailed). *Pearson correlations significant at the 5% level (two-tailed).

N = 636, except for *LEG* (N = 630), *ENF* (N = 624) and *LIT* (N = 285)

Table 6 – Results of logistic regression analysis

	Expected sign	Coefficient	Z-value (p value, two-tailed)
<i>Constant</i>		-9.720	-1.48 (0.138)
<i>LEG</i>	(-)	-1.189	-3.82** (0.000)
<i>ENF</i>	(-)	-1.172	-4.87** (0.000)
<i>RESP</i>	(+)	0.274	3.41** (0.000)
<i>SIZE</i>		0.111	0.57 (0.569)
<i>CAP</i>		-0.096	-0.51 (0.607)
<i>OILCHEM</i>		1.218	3.48** (0.001)
<i>UTI</i>		-0.532	-0.79 (0.430)
<i>PROD</i>		-1.794	-4.09** (0.000)
<i>FIN</i>		0.628	1.01 (0.311)
<i>Year 2002</i>		0.618	1.57 (0.117)
<i>Year 2005</i>		0.495	1.29 (0.197)
Pseudo R ²		0.200	
Wald Chi-Square (p value, two-tailed)		59.76** (0.000)	
N		341	

Dependent variable: *AST*. Variable definitions are provided in Table 1.

**significant at the 1% level (two-tailed).