Table of Contents

List of abbreviations

International Federation of Accountants (IFAC)
Global Reporting Initiative (GRI)
National Corporate Responsibility Index (NCRI)
Return on assets (ROA)

List of appendices

1. Introduction

In the last years it has been indicated that in order to provide a full and accurate picture of their business, companies have to present additional information other than their financial report.[1] Consequently there has been an increase in the demand for sustainability reporting. Unlike the obligatory character of the financial auditing practice, however, sustainability assurance remains voluntary.[2] Nevertheless, it appears that companies find this non-financial auditing practice valuable, as the market for assurance continues to develop.[3]

The voluntary character of sustainability assurance makes it interesting to know, what motivates companies to verify their reports. Overall there has been limited standalone research on the determinants of sustainability assurance. Nevertheless this paper attempts to present a summarized overview on the findings in this field of study. We focus on the determinants of adoption of sustainability assurance and on the choice of assurance provider.

The paper begins by reviewing the most fundamental theories on the matter, following which we outline key literature and present sustainability assurance in the practical context. The paper continues with a short description of the methodology used in our main sources of information – Kolk and Perego (2010) and Simnett et al. (2009). Afterwards we focus on the results of these two papers on the determinants of sustainability assurance and compare these to other scientific studies. In our analysis we distinguish between internal and external determinants, as this proves to be an appropriate and common differentiation in the literature. At the end of each section we try to present a critical appraisal for any possible discrepancies in the empirical results. In the final part we present major conclusions on this matter and outline possible fields of research.

2. Accounting for sustainability – the role of the assurance practice

2.1. Overview on the essential theories in the field of sustainability accounting

Sustainability accounting has been of interest for many practitioners and scholars for a long time. The concept has left the theoretical realm long ago; nevertheless it is still necessary to review the basic theories that underpin this concept, in order to fully

[1] See Shum et al. (2009), p. 1.
[2] See Simnett et al. (2009), p. 939.
[3] See Kolk (2008), pp. 1-15.

understand the importance and necessity of sustainability reporting and assurance. For this reason we provide a short summary of the following theories.

First of all we consider stakeholder theory. According to this theory a company has to take into account not only shareholder but also stakeholder requirements.[4] By issuing a sustainability report a company fulfils the information needs of the stakeholders.[5] This raises society's acceptance towards the corporation.

This leads to the next theory, namely the signalling theory. It assumes that the distribution of information is asymmetric, since it is difficult for external parties to get access to credible information.[6] In the field of information asymmetry sustainability reporting is a good way for a company to signal its engagement in conducting a sustainable business.[7]

According to legitimacy theory a company needs to justify its right to exist in order to be accepted by society. If a company operates in an unacceptable way and neglects to assure its credibility and reputation, it may face public scrutiny and be denied a license to operate.[8] For this reason firms are motivated to show their engagement to sustainability, by accounting for it and issuing sustainability reports.

Furthermore institutional theory suggests that companies make decisions not only on a rational basis but also on an institutional one. They act this way to satisfy expectations of the environment.[9] Therefore sustainability reporting might be conducted in a manner that does not contribute to the quality of the report, but is a mere window dressing practice. For this reason sustainability assurance represents a possible solution to this problem.

According to Chow (1982), agency theory is very important for understanding the sustainability assurance practice.[10] This theory postulates that problems of information asymmetry frequently appear in companies with principal-agent relationships. Because the behaviour of a manager cannot be observed by the non-managing shareholders, moral hazard problems may easily occur. In the end, it isn't clear whether the manager acts in the principal's interest or in his own. So when institutional creditors ask for credible reports, principals cannot guarantee the report's credibility, without incurring any additional monitoring costs. Often it appears more cost effi-

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[4] See Laplume et al. (2008), p. 1153.
[5] See Laplume et al. (2008), p. 1164.
[6] See Connelly et al. (2010), p. 40.
[7] See Connelly et al. (2010), p. 60.
[8] See Suchman (1995), pp. 573-574.
[9] See Rahaman et al. (2004), p. 40.
[10] See Chow (1982), p. 272.

cient to require third-party assurance on the sustainability report.[11] In other words, in the case of asymmetric information sustainability assurance is conducted in order to increase the credibility of reporting, gain a higher level of control and reduce agency costs. To sum up, all of the above mentioned theories offer insights into the importance of sustainability assurance.

2.2. Sustainability assurance in the sustainability accounting literature

In the last 30 years sustainability assurance has been a major subject in the literature on sustainability accounting. As this is a wide field of research, scholars have focused on a variety of aspects. While O'Dwyer et al. (2011) have focused on analysing sustainability assurance from the perspective of legitimacy theory[12]; other scholars have focused on more practical-oriented issues, such as the drivers and determinants of sustainability reporting.[13]

Overall scientific research focused on the determinants of sustainability assurance is limited. As this is a voluntary external practice, it has similar characteristics as the voluntary adoption of financial audit. Therefore many scholars refer to prior research on the determinants of voluntary financial assurance and use its results as benchmark for their own studies. The work of Chow (1982) has been influential to many. Using agency theory, Chow (1982) investigates the determinants of voluntary financial audit and provides evidence that both firm size and debt have a positive influence on the decision to adopt voluntary financial audit.[14] Later on Carey et al. (2000) provide support for their findings on the effect of firm size and leverage. [15] Moreover, they review the effect of ownership separation on the adoption of financial audit by family business.

Recently, however, scholars have begun research in the field of sustainability disclosure. Brammer and Pavelin (2006) have acknowledged that the quality of sustainability reports defers and that verification determines the quality, hence the credibility of the report.[16] Gallo and Christensen (2011), on the other hand, focus on factors, determining sustainability reporting behaviour. According to their study, firm size, ownership and industry affiliation have a strong effect on the decision to verify

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[11] See Chow (1982), pp. 273-274.
[12] See O'Dwyer et al. (2011), p. 31-52.
[13] See Hahn and Kühnen (2013), pp. 5-21.
[14] See Chow (1982), pp. 272- 291.
[15] See Carey et al. (2000), pp. 37-51.
[16] See Brammer and Pavelin (2006), pp. 1168-1188.

the firm's report.[17] Finally some authors focus their attention specifically on the determinants of sustainability assurance. Taking prior results into consideration, Simnett et al. (2009) and Kolk and Perego (2010) distinguish between country-level, industry-level and company-level determinants.[18] In a working paper Shum et al. (2009) draw on political theory and thus provide additional insights into the subject.[19] The outcome of those empirical works provides the main focus of this paper. But before we proceed with a detailed examination of the topic, we will outline its practical importance.

2.3. Sustainability assurance in the practical context

In recent years companies have realized the need to maintain a sustainable business. Sustainability reporting has become common practice for some of the biggest corporations worldwide and sustainability assurance standards like the International Standard on Assurance Engagements (ISAE 3000) or the AccountAbility AA1000 Assurance Standard (AA1000AS) have been established.[20] However, in order to prove that a report „truly represents the company's efforts and achievements"[21] in conducting a sustainable business, some kind of control mechanism is needed.

Assurance is a non-financial auditing practice, for which an objective third party reviews and, using some kind of criteria, assesses the company's sustainability report, thereby enhancing the credibility of the report towards diverse stakeholders.[22] The reasons why companies seek this kind of service can be externally as well as internally driven. External incentives include above all improving the company's credibility, trust and reputation towards diverse stakeholders or responding to local requirements.[23] Companies also appreciate internal benefits of assurance. By raising the quality of reporting information and improving the reporting process, corporations manage to reduce risk and improve decisions.[24]

Overall the demand on sustainability assurance is growing. In 2011 KPMG reports that 40% of the G250 (250 companies from the Fortune Global 500 list), doing sus-

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[17] See Gallo and Christensen (2011), pp. 315-349.
[18] See Simnett et al. (2009), pp. 937-967.
See Kolk and Perego (2010), pp. 182-198.
[19] See Shum et al. (2009), p. 1-26.
[20] See Global Reporting Initiative (GRI) (2013), p. 12.
[21] KPMG (2002), p. 18.
[22] The International Federation of Accountants (IFAC) presents an accurate and commonly used definition of assurance, which was used as a benchmark for this paper as well. See IFAC (2012), p. 16.
[23] See GRI (2012), pp. 6-7.
[24] See KPMG (2008), p. 62.

tainability reporting have their reports assured.[25] Therefore it is not surprising that all the major auditing firms provide this kind of service. In this paper we analyse the KPMG reports from 2002 to 2011 in order to better understand the trend in sustainability assurance for the past 10 years. Until 2008 France, Spain and Italy were the leaders in sustainability reporting with constantly growing assurance rates, while the U.S. and Canada were at the bottom of the chart with assurance rates lower than 20%.[26] In 2011 India and South Korea were included in the survey for the first time and took the leading positions in the chart.[27] Analysing the different sectors, it appears that mining, utilities and oil and gas have the highest assurance rates.[28] Interestingly enough scientific papers on the determinants of sustainability assurance have focused precisely on country- and industry-based factors. These will be discussed later in this paper.

The analysis of the assurance market shows that there are different kinds of assurance providers, competing against each other. A common differentiation is made between assurance providers from the auditing profession and other assurance providers.[29] The first are more business oriented, while the latter focus on sustainability and technical issues. According to the survey done by the GRI in 2013, accountancy firms dominate the market.[30] This makes it interesting to know what determines the firm's choice of assurance provider. Together with the voluntary adoption of sustainability assurance, this issue is the subject of discussion in the next section.

3. Analysis of the internal and external determinants of sustainability assurance

Further into this section we discuss the external and internal determinants of sustainability assurance by comparing different views on the subject. Sometimes authors come to different conclusions on the same subject due to different research methodology. Therefore we present key facts for each model we examine. Nevertheless, we recognize the significance of a thorough empirical analysis and for this purpose we will at first outline the methodology used in our two most influential and relevant sources. The works of other scholars, which are also discussed in this paper, present similar models.[31]

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[25] See Appendix 1 and Appendix 2.
[26] See Appendix 3.
[27] See Appendix 4.
[28] See Appendix 5.
[29] See Simnett et al. (2009), p. 941.
[30] See Appendix 6.
[31] To test their hypothesis scholars most often use regression models.

3.1. Analysis of the methodology and data used in sustainability assurance research

To begin with, the work of Simnett et al. (2009) is particularly interesting, because it collects data on sustainability reporting and assurance activities for the period of three years on an international level.[32] The authors use a sequential logistic regression (logit) model, i.e. the whole models consists of three levels. On each level a binary logit model tests one of the following sequential company decisions: (1) whether to adopt a reporting practice or not; (2) whether to assure the issued report or not; (3) whether to choose an assurance provider from or outside the auditing profession. At the end, the whole model tests whether assurance decisions depend on country-level and industry-level factors. Company-level determinants are used as control variables.

Similar to Simnett et al. (2009), Kolk and Perego's work from 2010 also undertakes an international survey. The reviewed 212 firms are from the first half of the Fortune's Global 500 list. Data is collected from the same companies for the years 1999, 2002 and 2005 (panel data). Using data from multiple, but identical subjects over the course of time (a pooled cross-sectional logistic regression model) Kolk and Perego (2010) test whether country-level factors determine the decision to adopt assurance. Company-level and industry-level factors are used as control variables. Furthermore the logit model adds two additional dummy variables, computing whether a company issues a sustainability report and whether this sustainability report is assured. Compared to Simnett et al. (2009) this model is more basic, because it lacks the sequential element. On the other hand, Simnett et al. (2009) do not use panel data, hence are unable to track the change of assurance behaviour within a fixed sample.

3.2. Internal determinants of sustainability assurance

3.2.1. The effect of firm size on the adoption of sustainability assurance

Overall the literature is consistent on the positive relationship between a firm's size and its demand for assurance. Benchmark for this proposition is, in many cases, Chow's study from 1982 on the voluntary demand for third-party assurance. To explain his results, Chow (1982) uses agency theory and speculates that the marginal benefits of assurance (observing managerial behaviour) increase with firm size, while the marginal cost of assurance (establishing a monitory system) decreases.[33] To test the predicted positive relationship, the author runs univariate and multivariate tests

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[32] See Simnett et al. (2009), p. 939.
[33] See Chow (1982), p. 276.

on a sample of 165 companies, where size is determined as the sum of the owner's equity market value and the book value of debt. The study yields, as predicted, significant positive results. Although he focuses on the verification of financial statements, Chow's findings can be transferred in the context of sustainability assurance.
Carey et al. (2000) support Chow's suggestion for a positive relationship between firm size and the voluntary decision to audit the financial reports. They run a logistic regression model for a sample of 186 family companies in Australia.[34] In this case firm size value is comprised out of three components – sales, number of employees and the value of assets.
Simnett et al. (2009) shift the focus and examine the determinants of voluntary sustainability assurance. They lean on Chow's (1982) and Carey et al. (2000) findings and thus use firm size as a control variable. Size is positively associated, according to Simnett et al. (2009), with the company's sales and is thus measured by a logarithm of the latter. As expected the results show a significant positive relationship, i.e. larger companies are more inclined to verify their reports in comparison to smaller ones.
Kolk and Perego (2010) also use the firm's size as a control variable in their study; however, they define size as the natural log of the corporation's revenues. Although Kolk and Perego (2010) disagree with Simnett et al. (2009) on the significance of this positive relationship between firm size and the assurance adoption, they are at one on the subject of firm size as a determinant of the choice of assurance provider. Both studies find proof of a significant positive relationship. Assurance providers from the auditing profession are usually more expensive; however, they also bring a better reputation and are perceived as more trustworthy.[35] Therefore it is natural, that larger corporations are willing and able to pay a higher price for being associated with a more trustworthy assurance provider.
Nevertheless there are a few scholars that find a negative correlation between firm size and the demand for assurance, e.g. Shum et al. (2009).[36] To explain their findings Shum et al. (2009) point out the short-term orientation of listed companies, when it comes to resource allocation decisions.
In general one can assume that the positive relation between firm size and the adoption of sustainability assurance is likely, as most of the empirical research provides proof for this. Shum et al. (2009) results on this subject can be questioned, not only

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[34] See Carey et al. (2000), pp. 37-51.
[35] See Simnett et al. (2009), p. 941.
[36] See Shum et al. (2009), pp. 10-11.

because they are outliers, but on account of the limited information that the authors present on the used methodology. The proxy for firm size, they use is measured by comparing the median of firm size (measured as the natural logarithm of sales) across countries.[37] The authors compare median firm size across 38 developing and emergent countries but additional information on country characteristics is not provided. Different country characteristics, like size or business culture, however, could have influence on the median firm size in the country. Consequently when comparing firm sizes across countries the authors face the risk of omitted variable bias. For this reason this comparison approach is rather uncommon in the literature. This could be a possible explanation, why Shum et al. (2009) find a negative influence of firm size on the decision to adopt sustainability assurance, oppose to the consistent view in the literature on this matter.

3.2.2. Firm leverage as a determinant of the adoption of sustainability assurance

Firm Leverage is defined in the literature as the ratio between the external capital of a company and its equity. One proposition for the relationship between a company's debt ratio and its demand for assurance can be drawn from Chow's study from 1982. Using agency theory, Chow (1982) predicts that the higher the firm's leverage, the higher the possibility that managers will act opportunistically in times of risky debt outstanding. Hence the higher the need for assurance contracts, which will retrieve managers from carrying suboptimal investments. In his paper, Chow (1982) measures leverage as the debt/equity ratio, using the firm's size as the proxy for equity. With the help of a Mann-Whitney U Test, he provides significant empirical support for his hypothesis.[38] Further research e.g. Carey et al. (2000) also provide results in favour of this positive relation between firm leverage and the demand on assurance.[39]

Contradictory to research on the determinants of voluntary adoption of financial audit, Simnett et al. (2009) find no significant proof that more leveraged companies are more willing to assure their sustainability reports. Despite this the study points out, that companies with lower leverage are more likely to be assured by an assurance provider from the auditing profession. The paper suggest the following explanation for its results: Companies with higher leverage carry higher financial risk and are therefore avoided by the auditing profession. Shum et al. (2009), who also find no

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[37] See Shum et al. (2009), pp. 14-16
[38] See Chow (1982), pp. 274-276.
[39] See Carey et al. (2000), p. 41.

significant correlation between leverage and the demand for sustainability assurance, speculate that investors, such as bankers, are more interested in the financial statement rather than the credibility of a company's sustainability.[40]

Based on the findings in the literature it appears that leverage does have a positive influence on the decision to voluntary adopt financial audit. Although a similar effect on the adoption of sustainability assurance was expected, there seems to be no significant empirical proof for such a relationship. This question might be worth more future attention.

3.2.3. The influence of firm profitability on the decision to assure sustainability reports

The company's profitability is usually measured by the return on assets (ROA). It is expected that the more slack resources the company has, the higher the probability that part of those will be invested in sustainability reporting and assurance.[41] However, this positive relationship is somewhat arguable, as little empirical research was able to attest for it. Here we present some of the scientific findings on this matter.

Brammer and Pavelin (2006) study the determinants of voluntary sustainability disclosure, but they also examine the decision to improve the quality of the disclosed reports. The authors associate higher quality with six factors, one of which is sustainability assurance. For a sample of 447 large UK companies, they find no evidence for a significantly positive relationship between the company's profitability and the disclosure quality.

Simnett et al. (2009), who concentrate specifically on the determinants to adopt assurance, find a slightly significant positive relationship between profitability and the assurance adoption, when looking at all the reports. The significance of the relationship disappears, however, when the environmental reports are excluded from the sample. Simnett et al. (2009) also examine the influence of profitability on the decision to purchase assurance from a member of the auditing profession, but fail to find any significant relationship there as well.

In contrast to the above mention studies, Shum et al. (2009) find strong support for the positive influence of profitability on a company's demand for assurance.[42] Shum et al. (2009) explain their findings through the companies' economic benefits from assurance, like enhancing stakeholders trust and improving credibility. The authors compare the median of firm profitability (measured by the ratio between net profits

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[40] See Shum et al. (2009), p. 17.
[41] See Brammer and Pavelin (2006), p. 1174.
[42] See Shum et al. (2009), pp. 9-16.

to lagged total assets) across countries, in order to account for a possible cross-country variation. As we explained above this uncommon methodology might fail to consider the possible effect of country characteristics on firm profitability. Nevertheless, due to the fact that the scholars are at odds with each other on the effect of firm profitability on sustainability assurance adoption, it might be advisable to consider further investigation in this area.

3.2.4. The effect of the ownership structure of a company on the adoption of sustainability assurance

Ownership structure is determined by the number, identity and distribution of wealth among the owners of a company.[43] Naturally, there are different kinds of ownership structures – corporate ownership, public vs. private ownership, state ownership etc. For the purpose of examination we adopt Gallo and Christensen's (2011) suggestion to differentiate between public and private ownership.[44] The first is characterized by small and dispersed owners, while the latter by concentrated, large owners. The authors suggest that listed companies have in general a wider variety of stakeholders, all of which may require verified information on the firm's sustainability performance. However, we believe agency theory explains the influence of firm ownership structure on the adoption of assurance practice better.[45] Private owners or large shareholders have good incentive to monitor managerial reporting, i.e. their benefits from doing so (e.g. in the form of dividends) exceed the monitoring costs. Small and dispersed owners, on the other hand, have little incentive for monitoring manager behaviour. This can be seen as the classical free-rider problem. Therefore it is more efficient to engage an objective third-party to assure the information in this case.

Although we have come across a scarce number of studies, which examine the relationship between ownership structure and the decision on assurance adoption, the empirical work of Gallo and Christensen (2011) provided us with useful insights into this matter.[46] The authors use a multidimensional regression model to test their hypothesis, namely that listed companies are more likely to seek validation, in order to control and monitor the issue of sustainability reports in comparison to privately owned firms. For this purpose the authors use three dummy variables, all of which represent different kinds of companies with non-private ownership – public, foreign-

[43] See Jensen (1976), pp. 305-360.
[44] See Gallo and Christensen (2011), pp. 324-325.
[45] Likewise Brammer and Pavelin (2006) use agency theory to explain the influence of firm ownership structure on the decision to disclose sustainability information.
[46] See Gallo and Christensen (2011), pp. 324-325.

owned and other companies (government, education, Not-for-Profit, other). By excluding private companies they are able to compare the influence of public and privately owned companies on the need of a verification mechanism. According to their results, based on a sample of 992 companies, Gallo and Christensen (2011) find significant support for their prediction, i.e. that listed corporations are more inclined to seek a control mechanism for their reporting behaviour rather than privately owned ones.

To examine the influence of firm ownership on the quality of disclosure Brammer and Pavelin (2006) compose the variable ownership dispersion to measure the proportion of the size of the largest shareholder to the firm's share capital.[47] Acknowledging a significant cross-sector variation, i.e. that the result may differ substantially due to the industry the company is in, the author find support for the negative relationship between ownership dispersion and the quality of the disclosed information. In this context, this means that more dispersed firms are more likely to seek assurance.

Although many scholars take the effect of company-basic determinants for given, it appears that in the sustainability context their influence on assurance might deserve more examination.

3.3. External Determinants of Sustainability Assurance

3.3.1. The business culture of a country as a determinant of the demand for sustainability assurance

We begin our analysis of the external determinants of sustainability assurance with a discussion on the effect of the country's business culture on assurance adoption. The determinant business culture of a country indicates that there is a difference between companies operating in code law countries and companies operating in common law countries. Common law countries consider mainly the interests of shareholder. On the contrary, code law countries are more stakeholder-oriented. This differentiation is based on stakeholder theory. Since stakeholders don't have access to credible information it can be assumed that firms operating in code law countries will be interested in satisfying the stakeholders information needs. Moreover, they are more likely to have their sustainability reports assured, because this will be a good way to improve credibility towards stakeholders.

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[47] See Brammer and Pavelin (2006), p. 1180.

To test this assumption, Kolk and Perego (2010) use the legal origin of a company as a dummy variable that takes the value one for a common law country and the value zero for a code law country. Their study provides support for the thesis, that companies domiciled in code law countries more often assure their sustainability reports compared with companies domiciled in more shareholder-oriented countries[48]. Shum et al. (2009) also confirm this assumption with their studies. The definition of the used variable legal system is vice versa to the dummy variable used by Kolk and Perego (2010). It significantly is related with the choice for assurance[49]. Simnett et al. (2009) find support for this connection in their studies as well.[50] However Simnett et al. (2009) point out that some countries have a huge impact on the results of the logit model they use. Particularly striking is a very low level of assurance in the U.S. which they lead back to the already existing standards in this country. The U.S. are a shareholder-oriented country, so one has to consider that this cross-country variation could possibly shift the results and lead to the inaccurate conclusion, that shareholder-oriented countries seek less assurance. For this reason Simnett et al. (2009) repeat their studies excluding the U.S. In this case they don't find that the frequency of assurance is higher in code law countries than in common law countries.[51]

Regarding the choice of assurance provider the scholars seem to disagree. Consistent with their findings on the demand for assurance by code law countries, Simnett et al. (2009) find that, stakeholder-oriented countries are more likely to choose an assurance provider from the auditing profession.[52] This result remains even after excluding the U.S. observations from the sample. As assurance providers from the auditing profession are considered to be more trustworthy, a company can increase its credibility and reputation by choosing one of them. This suggestion is supported by the empirical finding that companies, located in stakeholder-oriented countries choose assurance providers from the auditing profession more frequently. The reason for this decision lies in the company´s need to provide stakeholders with credible information.

Contrary to Simnett et al. (2009), Kolk and Perego (2010) come to a different conclusion. Their results show that in common law countries (shareholder-oriented) the

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[48] See Kolk and Perego (2010), pp. 191-193.
[49] See Shum et al. (2009), pp. 15-18.
[50] See Simnett et al. (2009), pp. 947-956.
[51] See Simnett et al. (2009), p. 961.
[52] See Simnett et al. (2009), p. 960.

likelihood to choose an assurance provider from the auditing profession is significantly higher[53]. A possible explanation for this finding is not given by the authors.

As mentioned above, a cross-country variation could lead to the distortion of the results. This explains the decision of Simnett et al. (2009) to undertake a second analysis, which excludes the U.S. from the sample. At the same time this poses the question whether we can view the findings of other authors as robust, if they fail to consider the fact, that large countries from one or the other business culture could possibly shift the results within the sample. To prove whether there really is a correlation between the choice to adopt sustainability assurance and the company's business culture more research that considers the plausibly huge impact of different countries has to be made.

3.3.2. The impact of institutional factors on the decision to adopt sustainability assurance

One reason for the company's decision to issue a sustainability report is the need to respond to public pressure.[54] This proposition can be derived from legitimacy theory, i.e. if a company neglects to react to society's needs it will be denied a license to operate.

Based on this, Kolk and Perego (2010) test the hypothesis that the probability to have sustainability reports assured is higher for countries, where public pressure is higher.[55] The authors choose the independent variable responsibility index to measure public scrutiny. The definition of the responsibility index is taken from the National Corporate Responsibility Index (NCRI) for a given country, measured by AccountAbility in 2005.[56] Kolk and Perego (2010) find that there is a significant positive relationship between the demand for assurance and the level of public pressure for corporate sustainability in the country where the company is situated.[57]

Although Kolk and Perego (2010) fail to find a connection between the company's decision to choose a large accounting firm to assure its reports and the institutional pressure in the country of origin, Perego's study from 2009 successfully proves this relationship with significance. He examines a sample of 136 companies from the 200 companies that were short-listed for the 2005 Association of Chartered Certified Accountants (ACCA) Sustainability Reporting Award.[58] With a logistic regression

[53] See Kolk and Perego (2010), p. 194.
[54] See Walden and Schwartz (1997), pp. 129-131.
[55] See Kolk and Perego (2010), p. 187.
[56] See Zadek et al. (2005), p. 99.
[57] See Kolk and Perego (2010), pp. 191-193.
[58] See Perego (2009), pp. 415-416.

model he tests whether a firm chooses a Big-4 firm as assurance provider or not.[59] Although he also uses the NCRI as a control variable, Perego (2009) finds the influence of the country's public responsibility on the choice of the assurance provider from the auditing profession to be a significant one. Or in other word, companies domiciled in countries with a higher sustainability profile are more likely to have their sustainability report assured by a Big-4 firm.[60]

The fact that the authors use the same index and still conclude different findings shows, that the results may depend on the chosen sample data. While Kolk and Perego (2010) use panel data from the first half of the Global Fortune 500 List, Perego (2009) constructs his sample from companies, who received a nomination for an award on sustainability reporting. One could assume that such companies have had outstanding quality of their reports. As Brammer and Pavelin(2006) suggest, a higher sustainability reporting quality is promoted by assuring the given report. Furthermore the literature associates higher assurance quality with assurance provides from the auditing profession.[61] This line of thought leads to the presumption that by choosing companies with outstanding sustainability reporting activities, Perego (2009) might have come to inaccurate results.

3.3.3. The influence of the legal enforcement factor on the adoption of sustainability assurance

To explain this determinant, one has to differentiate between countries with weak and strong legal enforcement mechanisms. In the literature there are various opinions on whether the choice to assure sustainability reports is higher in countries with weak or in countries with strong legal enforcement mechanisms.

A possible function of sustainability assurance in countries with weak legal systems is the reduction of information asymmetries. Through sustainability assurance firms raise their credibility towards stakeholders and are thus able to lower transaction costs when contracting with stakeholders. Based on this assumption Kolk and Perego (2010) examine the hypothesis whether sustainability assurance is more likely in countries with weaker enforcement mechanisms or not.[62] In the logistic regression model enforcement is used as an independent variable, to test the quality of a country's legal environment. The authors find significant results supporting their hypothe-

[59] Assurance providers from the Big-4 (KPMG, PwC, Deloitte and Ernst and Young) represent the assurance providers from the auditing profession.
[60] See Perego (2009), pp. 418-422.
[61] See Simnett et al. (2009), p. 941.
[62] See Kolk and Perego (2010), p. 186.

sis. In the interpretation of their results auditing can be seen as a substitute for enforcement mechanisms and as a mean to increase the credibility of sustainability reports.

In contrast, Simnett et al. (2009) find that companies in strong legal environments are more likely to assure their sustainability reports.[63] The authors denote the tested variable as legal. It represents the rule of law index, which includes the degree of confidence of agents in rules of society, the quality of contract enforcement, the police, the courts and as well the amount of crime and violence.[64] Although the variable seems to have a positively significant influence on the demand for assurance, i.e. assurance seems to be more important for countries in strong legal environments, the significance of this variable decreases over the years.[65] Simnett et al. (2009) suspect an increasing importance of sustainability assurance in general as a possible explanation of this development. It is also plausible that the differences between the countries are shrinking, due to this fact. Similar to Simnett et al. (2009), Shum et al. (2009) use the same index to test the legal environment. Considering results from recent research on this matter, they suppose that countries with strong legal enforcements have a higher level of assurance. The authors refer to the lack of incentives for companies in countries with weak legal enforcement mechanisms to do high quality audit in their attempt to explain their results. [66] According to Shum et al. (2009) stakeholders anticipate this and regard the disclosed information as untrustworthy.[67]

Concerning the auditing profession, most of the authors find a connection between the choice of a large assurance provider from the auditing profession and the likelihood that the given company is situated in a country with weak legal enforcement mechanisms. Perego (2009) argues that firms in a strong legal environment have no need to choose an assurance provider form the auditing profession since there are enough control mechanisms.[68] In his logistic regression model he uses the variable enforcement that includes a law enforcement index and an investor protection index.[69] Confirming his prediction, results point to a higher likelihood to choose an assurance provider from the auditing profession in weak legal environments. Kolk and Perego (2010) reach the same conclusion. In their study they run the tests again,

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[63] See Simnett et al. (2009), pp. 956-960.
[64] See Kaufmann et al. (2007), p. 4.
[65] See Simnett et al. (2009), p. 965.
[66] See Shum et al. (2009), p. 18.
[67] See Shum et al. (2009), pp. 8-9.
[68] See Perego (2009), p. 414.
[69] See La Porta et al. (1998), pp. 1134-1145.

this time however they replace the variable enforcement with the variable litigation.[70] This variable describes the strictness of a country's legal regime. They find a significant negative correlation which means, that the higher the strictness of the legal system, the lower the probability of choosing a large assurance provider.[71]

To sum up, it appears that the demand for assurance is higher in countries with stronger legal environment, because in weaker legal environment sustainability assurance is perceived as ineffective. On the other hand the demand for an assurance provider from the auditing profession is higher for countries with weaker legal environment. One explanation could be that in weak legal environment it is necessary to choose the best assurance provider there is if the company wishes to compensate for the fact that assurance on the whole is perceived as untrustworthy. We assume that this is a possible way to achieve a higher credibility towards stakeholders.

3.3.4. The effect of industry affiliation on the adoption of sustainability assurance

If we want to understand why firms choose sustainability assurance it is important to have a closer look at a companies' industry affiliation. Environmental protection in the recent years has been a very acute topic in the media. Since there is a huge social interest, one could suspect that companies operating in industries with higher exposure to environmental risks have a greater need to increase the confidence of stakeholder. Sustainability assurance might prove to be a good solution to this problem.

Simnett et al. (2009) are testing this assumption with the aid of four dummy variables. Due to the large consumption of non-renewable resources in mining activities, companies in this sector are included. Second, the production industry is said to be the sector with highest energy consumption rates and to account for a large share of the waste disposal. Furthermore utilities seem to have a big impact on the climate change, as this industry produces the largest amount of greenhouse gas emissions. Since the finance sector has been playing a major role in society and has led to many social risks, this industry sector is also tested.[72]

The results show that three out of the four variables have a significant relationship with the company's decision to audit the disclosed information. Only companies in the production industry are not found to be more likely to have their sustainability reports assured compared with other industries.[73]

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[70] See Kolk and Perego (2010), pp. 188-194.
[71] See Kolk and Perego (2010), pp. 193-194.
[72] See Simnett et al. (2009), p. 945.
[73] See Simnett et al. (2009), p. 960.

The variables used by Kolk and Perego (2010) are the same, except for the variable, representing the mining industry. Instead they test whether companies in the oil, gas and chemical sectors have greater incentives to have their sustainability reports assured.[74] Although almost identical variables are tested, there is some discrepancy in the findings. A significant positive correlation with the demand of assurance is only found in the oil, gas and chemical industries. Contrary to Simnett et al. (2009), utilities and finance industry have no significant influence, according to Kolk and Perego (2010). The production industry even shows a significant negative effect on the likelihood to demand assurance. This means that companies operating in this sector actually are more unlikely to have their disclosed information assured, compared with other industries.[75]

Although Simnett et al. (2009) find strong support for the effect of industry affiliation on the demand for sustainability assurance they fail to find any connection concerning the choice of assurance provider. Kolk and Perego (2010) also find support for the impact of industry affiliation on choice of assurance provider, only when they test for the finance sector.[76] The latter is explained through the importance of stakeholders' interests in this sector. By engaging a large assurance provider the companies are able to increase the credibility of the disclosed information and to build good reputation.

In his study Perego (2009) concentrates only the determinants of the choice of the assurance provider. He includes the dummy variable industry affiliation to examine its effect on the demand for assurance provider from the auditing profession. In contrast to the other authors in the literature, he doesn't differentiate between several sectors. The variable equals one if a company produces petroleum, chemical, forestry or paper products and otherwise equals zero. Since these industries seem to be more harmful for the environment, companies operating in these sectors are exposed to severe social pressure. In his logistic regression model, the author doesn't find any support for his prediction. In order to provide robustness to his first model he implements a probit model. Using this model he finds the variable industry affiliation to be significantly positively correlated to the choice of assurance provider.[77] That implies that companies in the mentioned industries are more likely to have their reports assured from auditors, members of the auditing profession.

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[74] See Kolk and Perego (2010), p. 188.
[75] See Kolk and Perego (2010), pp. 191-193.
[76] See Kolk and Perego (2010), p. 193.
[77] See Perego (2009), p. 421.

Based on the above analysed findings it appears that industry affiliation might indeed have some influence on the adoption of sustainability assurance. However due to the discrepancy in scientific results on the matter it is our belief that this subject deserves further attention and examination.

4. Conclusion

This paper recognizes the role of sustainability assurance as a governance mechanism in the business practice. During our analysis we have researched for the most relevant determinants of sustainability assurance. Our study has found controversial opinions on the subject. Therefore it was our intention to enable the reader to reflect the topic critically. Throughout this paper we have provided information when possible both on the demand for assurance as well as the choice of assurance provider. For structural purposes we have distinguished between internal and external determinants. At the end of each section we have provided possible explanations for the discrepancies in scientific findings.

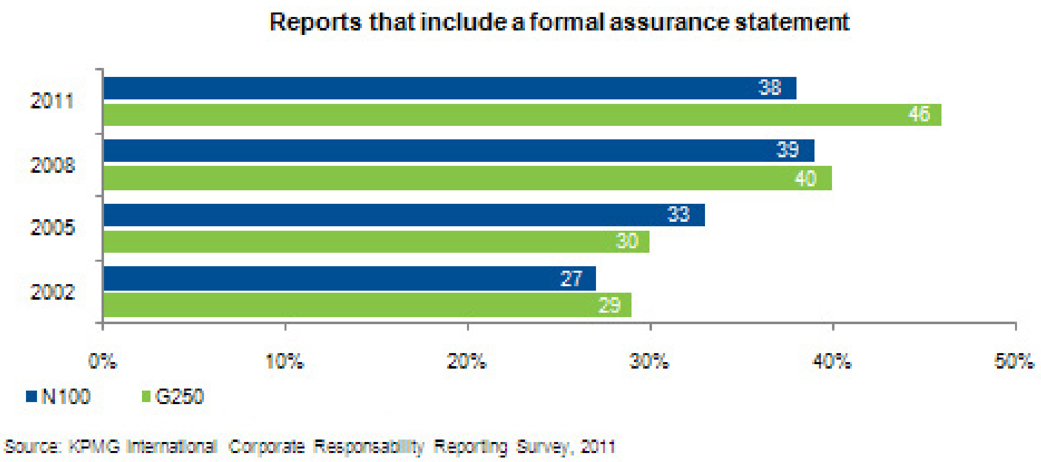
If there is a rather unified view on the effect of firm size on the adoption of sustainability assurance, one cannot say the same for firm leverage and profitability. On our research on the influence of the firm's ownership structure on the assurance decision we were able to find scarce information. Overall it was our impression that the scholars use company-based determinants as control variables in their models, assuming they have similar effect on the adoption of assurance as proven in prior research in the field of voluntary financial audit.

When examining the external determinants of assurance, it appears that most authors agree that assurance rates for companies domiciled in code law countries are higher than those in common law countries. The positive effect of institutional factors on the assurance adoption also seems to be a settled matter. Nevertheless, the scholars haven't made terms on the influence of the legal environment and firm's industry affiliation.

At the end, the further the economy develops the more acute the subject of sustainability and therewith sustainability reporting and assurance. In order to make progress toward a sustainable economy, one must recognize the necessity of further research in the field of sustainability accounting and implementation.

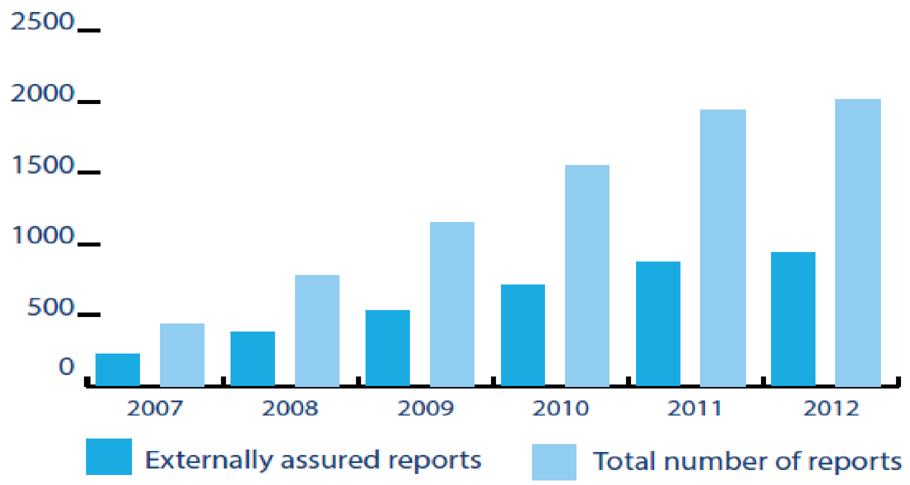
Appendix

Appendix 1: Sustainability assurance development for the period 2002-2011 according to the KPMG survey



Source: KPMG (2011), p. 30.

Appendix 2: Sustainability reporting and assurance development for the period 2007-2012 according to the GRI survey



Source: GRI (2013), p. 7.

Appendix 3: Number of assured sustainability reports, by country, for the period 2002-2008

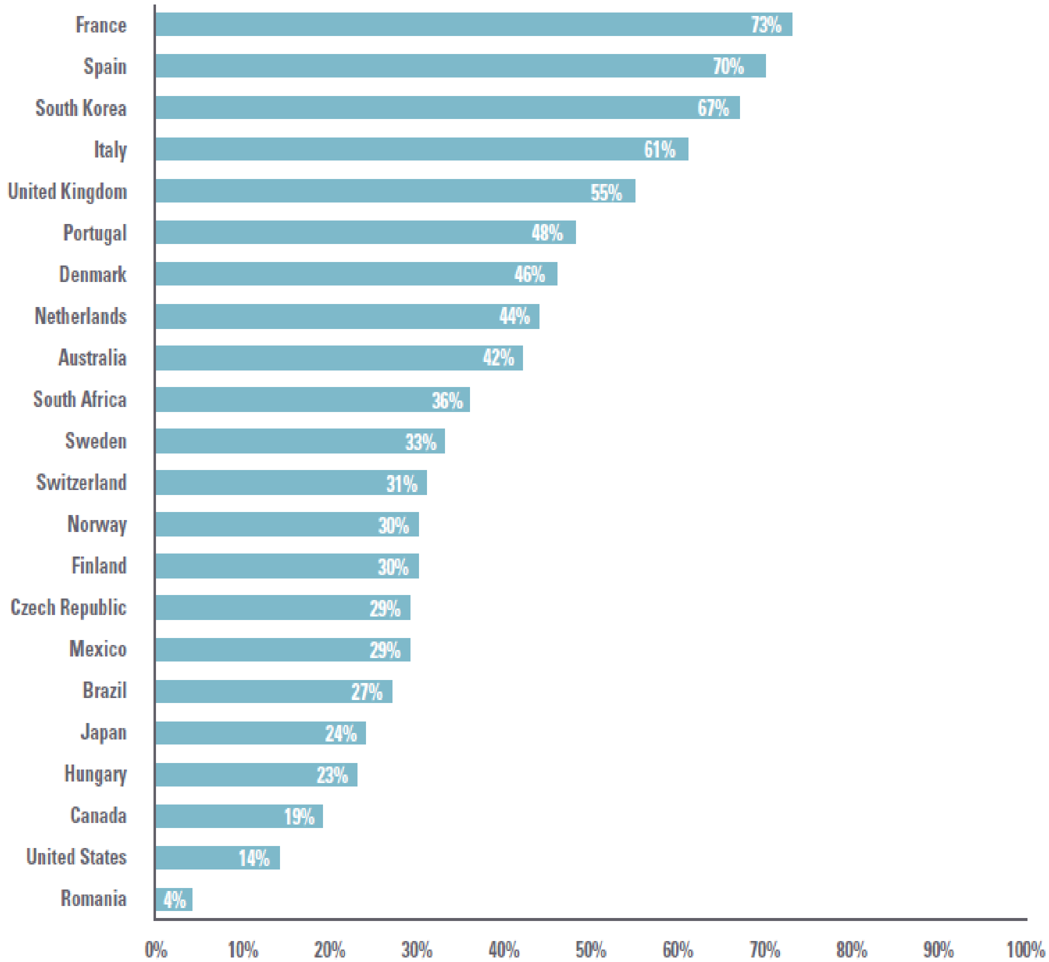
Country	2002 (percent)	2005 (percent)	2008 (percent)
France	14	40	73
Spain	27	44	70
Italy	66	70	61
UK	53	53	55
Denmark	45	31	46
Netherlands	38	40	44
Australia	42	43	42
South Africa	100*	22	36
Sweden	15	5	33
Finland	29	19	30
Norway	20	33	30
Japan	26	31	24
Canada	10	10	19
USA	2	3	14

(Selected countries where historical data are available)
*Only one report issued in 2002.

Source: KPMG Global Sustainability Services, October 2008

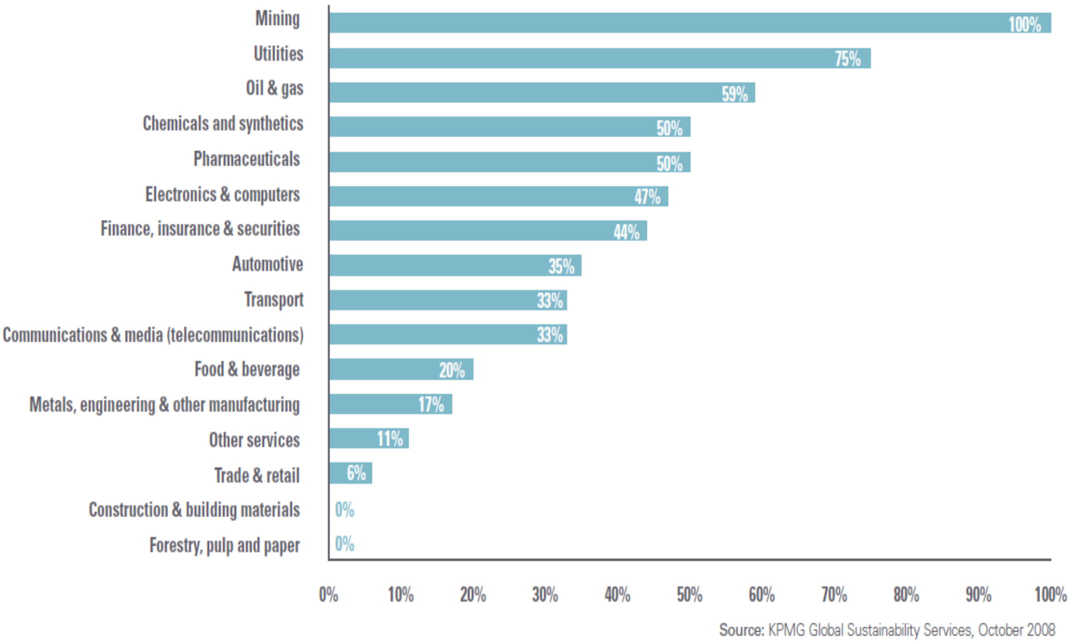
Source: KPMG (2008), p. 58.

Appendix 4: Percentage of companies, by country, which assure their sustainability reports in 2011



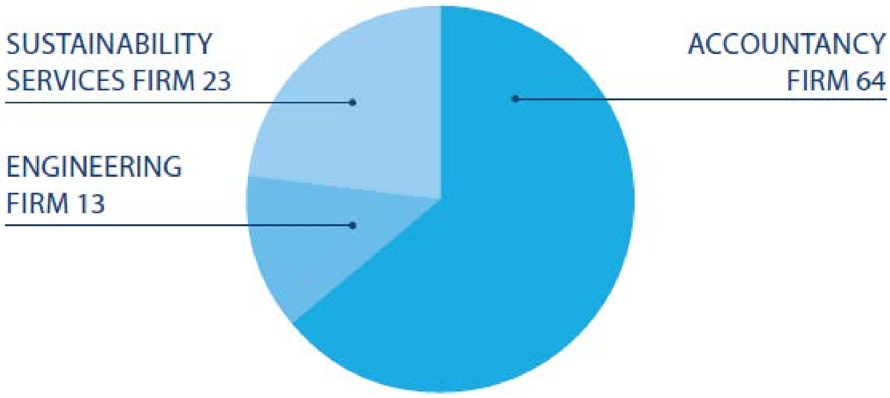
Source: KPMG (2011), p. 29.

Appendix 5: Percentage of companies, by industry, which assure their sustainability repots in 2008



Source: KPMG (2008), p. 59.

Appendix 6: The distribution of the sustainability assurance market in 2012



Source: GRI (2013), p. 10.

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