

GOODWILL IMPAIRMENT TEST DISCLOSURES UNDER IAS 36: COMPLIANCE AND DISCLOSURE QUALITY, DISCLOSURE DETERMINANTS, AND THE ROLE OF ENFORCEMENT

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Abstract

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Prior research documented that higher disclosure quality reduces information asymmetry and the cost of capital. Accordingly, firms have an incentive to comply with disclosure requirements and to provide voluntary disclosure. However, prior research on mandatory disclosures on goodwill impairment testing reveals low compliance among European firms. In this paper, we contribute to the literature and assist regulators, enforcers, and standard setters by shedding light on the determinants of the observed low levels of compliance and voluntary disclosure. Consistent with economic theory, we reveal that firms determine the level of disclosure strategically. We find firms with higher preparation and proprietary cost to show lower compliance and less voluntary disclosure while firms with higher growth opportunities provide better compliance and more voluntary disclosure. However, the strategic behavior is constrained by enforcement. Consequently, our results are more (less) pronounced within a weak (strong) enforcement environment.

Keywords: Goodwill, IAS 36, Disclosure, Enforcement, Notes

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1. INTRODUCTION

Prior research on mandatory and voluntary disclosure documents that an increase in the level or the precision of disclosure reduces the likelihood of information asymmetries and, accordingly, the information asymmetry component of a firm's cost of capital (e.g., Leuz & Verrecchia, 2000; Diamond & Verrecchia, 1991; for an overview, see Healy & Palepu, 2001; Leuz & Wysocki, 2016). Moreover, prior research shows that managers have an incentive to voluntarily disclose any information that distinguishes the current situation from the very worst possible outcome that leads to the

unravelling of private information (Beyer et al., 2010). Consequently, firms have incentives to comply with mandatory disclosure requirements and to provide higher disclosure quality in terms of additional voluntary disclosure as long as the benefits of disclosure exceed the direct and indirect cost of additional disclosure (Ellis et al., 2012; Dye, 1985; Verrecchia, 1983).

According to Johansen and Plenborg (2013), disclosures on goodwill and goodwill impairment testing are of particular concern for users of the financial statement but costly to prepare. These disclosures play an important role for users because IAS 36 provides the management with discretion in

conducting annual impairment tests. Moreover, empirical evidence suggests that impairment tests might not result in timely impairments (Schatt et al., 2017; Li & Sloan, 2017). Accordingly, goodwill impairment test related disclosures are essential as they may mitigate information asymmetries and help investors to formulate precise expectations about future earnings and cash flows (Schatt et al., 2017).

Prior research on goodwill impairment test related disclosures documents low levels of compliance with mandatory disclosure requirements in most studies. For instance, Glaum et al. (2013) examine disclosure compliance in 17 European countries and find that the overall compliance level concerning IFRS 3 and IAS 36 related disclosures is low and jointly determined by the firm- and country-specific characteristics. In line with these findings, Devalle and Rizatto (2012) investigate French, German and Spanish firms and find low compliance with IAS 36 disclosure requirements and wide differences between the countries. Although the documented overall low levels of compliance might appear surprising at first glance, papers that examine the relation between compliance levels and cost of capital find evidence largely consistent with economic theory. Paugam and Ramond (2015) find that prospective entity-specific impairment testing disclosures are negatively associated with the cost of capital, whereas descriptive disclosures exhibit no association with the cost of capital. Mazzi et al. (2017) find a negative relationship between the compliance with mandated goodwill related disclosures and the cost of capital. However, they also document that this negative relation can only be found for companies in a strong enforcement environment and for firms that did not meet market expectations towards goodwill impairment.

The issue of goodwill impairment testing disclosures has also attracted attention beyond academic research. Regulators, such as the European Securities and Markets Authority (ESMA), criticize the low goodwill related compliance quality among European listed companies as well as boilerplate and not entity-specific disclosures. To some extent and in line with prior research, ESMA attributes the observed low compliance levels and the low quality of disclosures to cross-country differences in enforcement. However, in its report, the ESMA does not identify possible causes for the observed low levels of compliance and disclosure quality explicitly (ESMA, 2013a; ESMA, 2013b). Meanwhile, national enforcers, such as the German Financial Reporting Review Panel, consider goodwill accounting and related disclosures as error-prone (FREP, 2009), while standard setters even discuss the necessity of regulatory changes (ESMA, 2013a; ESMA, 2013b; EFRAG, 2017; IASB, 2017).

In this paper, we contribute to the literature and assist regulators, enforcers, and standard setters by shedding light on the determinants of the observed low levels of compliance with goodwill impairment testing related disclosure requirements. Moreover, we take the quality of the disclosures into account and examine the determinants of goodwill impairment testing related disclosure quality. In doing so, we rely on two different self-constructed scores and define disclosures that embed more voluntary disclosure as of higher disclosure quality. Specifically, we examine the association among goodwill impairment test related disclosures and the

direct and indirect cost of disclosure. Based on economic theory and the findings by Paugam and Ramond (2015), and Mazzi et al. (2017), we expect firms to conduct a cost-benefit analysis by weighing the benefit of lower cost of capital induced by lower information asymmetry against the direct and indirect cost of additional disclosure. Accordingly, we expect firms with the higher direct and indirect cost of disclosure to offer less disclosure and firms with higher disclosure incentives to offer better disclosures, i.e. higher disclosure compliance and higher disclosure quality. Since a higher quality of the enforcement environment is likely to increase the cost of non-disclosure and litigation risk, we expect firms also to consider the quality of the enforcement environment when determining the level of disclosure. Consequently, we expect firms to offer less disclosure, in particular, when the cost of the disclosure is high and the enforcement environment is weak.

In our study, we analyze 864 consolidated financial reports of European listed companies. The results confirm prior research and ESMA's findings that the overall compliance with goodwill impairment test related disclosure requirements is rather low and reveal that this low compliance level cannot be attributed to a single disclosure requirement. Consistent with prior research and the ESMA, we identify the country specific-enforcement quality as a determinant of compliance and disclosure quality. Moreover, we posit and find that direct and indirect costs are a determinant of the observed low levels of compliance and disclosure quality. In particular, we provide evidence that firms engage in strategic behaviour when determining the level of disclosure and in deciding whether or not to comply with IAS 36 disclosure requirements. Based on economic theory, we show that disclosure compliance and disclosure quality decrease with preparation and proprietary cost and increase with growth opportunities. However, we also find that the association between proprietary cost and disclosure quality is more pronounced than the association between proprietary cost and disclosure compliance. This offers an indication that firms consider proprietary cost in particular when determining the quality of the disclosures, i.e. the level of additional voluntary disclosure.

Moreover, we show that the association between disclosure determinants and disclosure behaviour is dependent on the enforcement environment. In a weak enforcement environment, we find proprietary cost significantly negatively and growth opportunities significantly positively related to compliance and disclosure quality. In a strong enforcement environment, the association between proprietary cost and disclosure compliance is insignificant while the association with disclosure quality remains negative but just marginally significant. The association between disclosure and growth opportunities remains positive and significant but is of lower magnitude than in a weak enforcement environment. Therefore, we argue that a higher quality of enforcement curtails discretionary disclosure and forces firms to disclose also proprietary information as firms expect that enforcement and litigation cost due to non-disclosure exceed the proprietary cost. At the same time, also firms with disclosure incentives provide less voluntary disclosure. Arguably, due to

potentially higher sanctions and litigation cost within a strong enforcement environment.

Our study provides useful information to regulators, enforcers, and standard setters and contributes to the literature in different ways. First, we extend prior literature not only by measuring disclosure compliance but also by considering disclosure quality in particular. Second, we provide descriptive and multivariate evidence regarding the association between the cost of disclosure, firm characteristics, and enforcement and governance mechanisms for both disclosure compliance and disclosure quality based on a large sample of 864 consolidated financial reports of European listed companies. We document that in addition to enforcement, the direct and indirect costs of the disclosure are an important determinant of the observed low compliance and quality of goodwill impairment test related disclosures. Considering the comprehensive disclosure requirements of IAS 36 and the arising direct and indirect cost, many firms seem to find it beneficial to provide only boilerplate disclosure or even decide not to comply with IAS 36; in particular, when the enforcement environment is weak and cost of non-compliance can be expected to be low. The possible reduction in the cost of capital through increased levels of disclosure as addressed in prior research (Paugam & Ramond, 2015; Mazzi et al., 2017) seems not to be high enough to incentivize firms to increase the compliance and the quality of impairment testing related disclosures. Accordingly, our results help to increase the understanding of the observed low levels of goodwill impairment-related disclosure quality and related prior research findings. Particularly, our results assist regulators and enforcers in identifying firms with incentives for non-disclosure and have important implications for the development of enforcement mechanisms in Europe. For policy makers and standard setters, our results offer an empirical basis for reassessing the current mandatory disclosure requirements.

The remainder of the paper is organized as follows: Section 2 outlines the IAS 36 disclosure requirements and provides an overview of the ESMA's points of criticism regarding the current level of disclosure quality. Additionally, we discuss theory on disclosure incentives, disclosure cost, and disclosure behaviour. Section 3 discusses prior and related research on goodwill related disclosures and develops our hypotheses. Our research methodology and, particularly, the construction of our disclosure compliance and disclosure quality scores as well as our sample are described in Section 4. Our results are presented in Section 5. Section 6 summarizes and concludes the paper.

2. REGULATORY AND THEORETICAL BACKGROUND

2.1. IAS 36 disclosure requirements and ESMA's criticism of disclosure quality

Pursuant to IAS 36.8, an entity shall test goodwill acquired in a business combination for impairment annually. Irrespective of the outcome, IAS 36's disclosure requirements on goodwill impairment testing include the allocation of goodwill to cash-generating units (CGUs) and information relevant for the determination of the recoverable amount. The mandatory disclosure requirements comprise the basis on which the recoverable amount is

determined (value in use (VIU) or fair value less cost to sell (FVLCTS, since 2013 known as fair value less cost of disposal)), the key assumptions on which cash flow projections are based, the period over which cash flows are projected, and the disclosure of growth rates and discount rates, including explanations of how they are determined (IAS 36.134; see also Table 1). If material goodwill impairment is recognized, further disclosure requirements apply. Firms have to provide the events and circumstances that have led to the impairment loss as well as a description of the affected CGU. Moreover, disclosures of whether the recoverable amount is the VIU or the FVLCTS and disclosure of the impairment loss per segment are mandatory (IAS 36.130; see also Table 1).

In 2013, the ESMA published a "European enforcers' review of impairment of goodwill and other intangible assets in the IFRS financial statements". The ESMA analyzed disclosures with respect to the key assumptions of management, sensitivity analysis, the determination of the recoverable amount and of discount rates, and the disclosure of discount rates. Based on a sample of 235 European firms in 2011, the results show low overall compliance, and major disclosures related to goodwill impairment testing in many cases were boilerplate instead of entity-specific information. Accordingly, ESMA urges national enforcement authorities to focus on monitoring the application of and compliance with IAS 36. In doing so, ESMA attributes the observed low compliance levels and low quality of disclosures to cross-country differences in enforcement. Since 2014, goodwill accounting and related disclosures have been a "European common enforcement priorities" several times, lastly for the 2017 financial statements of listed companies (ESMA, 2017). In its 2017 enforcement priorities statement, ESMA "reminds issuers that the information on the assumptions and measurement techniques used in the valuation of material assets, liabilities and non-controlling interests acquired in a business combination is relevant for investors" (ESMA, 2017).

2.2. Disclosure and economic theory

Economic theory discusses the determinants of disclosures as it provides theoretical explanatory approaches for mandatory and voluntary disclosures. Theory suggests that information asymmetries result in agency conflicts and increase a firm's cost of capital. Increasing the level or precision of disclosure should reduce the likelihood of information asymmetries (Leuz, 2003; Leuz & Verrecchia, 2000; Diamond & Verrecchia, 1991) and, thus, reduce the information asymmetry component of a firm's cost of capital (Botosan & Plumlee, 2002; Botosan, 1997; Welker, 1985). Because investors might revise their beliefs about firm value downwards if managers do not provide high-quality disclosures, managers have an incentive to disclose any information that distinguishes the current situation from the very worst possible outcome voluntarily. This process leads to the unravelling of any private information (Beyer et al., 2010). However, in practice, firms do not completely disclose their private information because the unravelling result (the provision of any private information) occurs only under several conditions. For instance, it is necessary that investors know that the manager

withholds private information and that disclosure is costless (Beyer et al., 2010). Moreover, managers may withhold private information for opportunistic reasons. Verrecchia (1983) provides an explanation for how the existence of disclosure related costs influences managers' decision to exercise discretion in disclosing information. The direct cost is only one part of the costs incurred by preparing disclosures. In addition to direct cost, indirect cost of disclosure in the form of proprietary cost can occur. Verrecchia (1983) argues that the release of (accounting) information "may be useful to competitors, shareholders, or employees in a way which is harmful to a firm's prospects even if (or perhaps because) the information is favourable". Therefore, the existence of proprietary cost may cause information to be withheld. In that case, capital market participants are "unsure whether it was withheld because: 1) the information represents 'bad news', or 2) the information represents 'good news', but not sufficiently good news to warrant incurring the proprietary cost" (Verrecchia, 1983). Nevertheless, building on economic theory for the firm level firms have incentives to provide information voluntarily in situations in which firms' benefits from disclosure exceed their cost. Therefore, it would not be necessary to mandate disclosure as long as there is no social value of the disclosed information that exceeds its private value to firms (Leuz & Wysocki, 2016).

3. PRIOR RESEARCH AND HYPOTHESES DEVELOPMENT

3.1. Prior literature on the compliance with IAS 36 disclosure requirements and the existing research gap

Prior literature that examines impairment test related disclosure policies regularly focuses on disclosure compliance rather than disclosure quality. Existing studies on the association between goodwill impairment test related disclosures and firm characteristics usually do not differentiate in terms of the quality of the provided information. Usually, studies apply a dichotomous variable and simply measure whether a required disclosure is provided. Thus, boilerplate information and entity-specific information are treated equally. For instance, Glaum et al. (2013) investigate the compliance with IFRS 3 and IAS 36 related disclosures across 17 European countries and find an overall compliance level of 73% and reveal that different firm characteristics, as well as country-specific factors, are associated with disclosure compliance. Devalle and Rizatto (2012) analyze consolidated financial statements of companies listed in the main indexes of Italy, France, Germany, and Spain. Based on a dichotomous disclosure score, they find that compliance with the disclosure requirements of IAS 36 is relatively low and that there are wide differences among the analyzed countries. Based on a sample of French, German and British firms, Paananen (2008) shows significant country-specific differences and significant influences from firm characteristics in disclosure compliance measured by a dichotomous score. D'Alauro (2013) also measures compliance by a dichotomous score and finds a significant and positive association of the level of disclosure compliance with the magnitude of goodwill write-

offs and earnings performance in a sample of British and Italian firms. Verriest and Gaeremynck (2009) examine a sample of London Stock Exchange-listed European FTSE 300 companies which are expected to engage in goodwill impairments and find that better-performing firms and firms with stronger corporate governance mechanisms are more likely to impair. Disclosure quality is measured based on a score comprised of five disclosure items that are expected to provide relevant information to investors in terms of goodwill valuation. However, we believe that the score primarily captures disclosure compliance.

Outside of the EU setting, Bepari, Rahman, and Mollik (2014) analyze annual reports from Australian companies included in the S&P/ASX 500 list and measure a firms' compliance with the goodwill impairment test disclosures required by AASB 136 (equivalent to IAS 36) using a dichotomous compliance score. The results show that compliance levels differ among industries. Furthermore, they show that audit quality and goodwill intensity are positively associated with compliance levels during the global financial crisis but not in the pre-crisis period and that profitability is not significantly associated with compliance levels. Tsalavoutas et al. (2014) examine worldwide convergence of IFRS 3, IAS 36 and IAS 38 disclosures considering firms out of 23 countries with different institutional and regulatory regimes. They reveal that firms reporting impairments comply less with mandatory disclosure requirements than firms without impairments. Moreover, they find cross-listings in the US and the strength of a countries' enforcement system to positively affect compliance levels.

Mazzi et al. (2017) examine compliance levels with IFRS 3 and IAS 36 disclosure requirements in a sample of European firms. By weighing each item of their disclosure score by the percentage of firms in the sample that do not comply with the item (i.e., an indicator for proprietary information), the results suggest that non-compliance relates mostly to proprietary information. Moreover, the results show a significantly negative association between the implied costs of capital and disclosure compliance levels. However, they also document that this negative relation can only be found for companies in a strong enforcement environment and for firms that did not meet market expectations towards goodwill impairment. Paugam et al. (2015) distinguish between descriptive and prospective categories in their disclosure score. They obtain a negative association between prospective impairment-testing-disclosures and the implied cost of capital based on a sample of French firms. Izzo, Luciani, and Sartori (2013) utilize an Italian setting and investigate the association between the financial crisis or firm characteristics and the level of disclosure compliance and quality regarding goodwill impairment testing. They apply a comprehensive disclosure score including mandatory items and items based on recommendations of the Italian standard setter. Principally, the individual items are coded on a three-step scale, taking into account whether the information is complete. Their results show that despite the improving quality over time, the disclosure quality is nonetheless quite low. However, they do not find any significant relationship between disclosure quality and firm characteristics. Another approach to analyze disclosure quality is to evaluate

the disclosure level with respect to specific disclosure requirements rather than on a firm level. For instance, Camodeca, Almici, and Bernardi (2013) provide descriptive statistics regarding different goodwill impairment test related disclosure requirements. Based on a sample of London Stock Exchange-listed companies, the results show rather low disclosure and compliance levels and reveal that firms do not provide disclosures additional to those that are explicitly required by IAS 36. In particular, sensitivity analysis disclosures and information regarding the key assumptions influencing the recoverable amount estimation show low disclosure levels.

It can be concluded that there is still little research on the IAS 36 setting, and most existing studies are limited to a single country or to just a few countries, which might bias the results. Additionally, most prior studies do not systematically examine the association between the observed compliance levels and disclosure incentives, disclosure cost, and further determinants. Furthermore, the existing literature generally focuses on disclosure compliance instead of disclosure quality. Research that takes the quality of the disclosures into account is still rather scarce. Nevertheless, there are some indications, that disclosure compliance is affected by the type of information; e.g., descriptive vs. prospective and proprietary information (Paugam et al., 2015). According to Mazzi et al. (2017) noncompliance relates mostly to proprietary information.

However, we argue, the rationales behind the unravelling principle and the proprietary costs affect disclosure quality rather than compliance. Therefore, in a first step, we believe it is necessary to distinguish between boilerplate information and entity-specific information while the latter can be interpreted as a form of voluntary disclosure. We follow Beretta and Bozzolan (2004) who state (with respect to risk disclosures) that “in the analysis of the disclosure ... attention has to be paid not only to how much is disclosed but also to what is disclosed and how”. In a second step, we believe, it is necessary to take the expected enforcement and litigation cost of non-compliance into account when examining goodwill impairment testing related disclosures. The association between non-disclosure and incentives for non-disclosure, such as preparation and proprietary cost, should be more pronounced when firms do not have to expect additional enforcement and litigation cost in case of non-compliance and vice versa.

3.2. Hypotheses development

Preparation cost

The compliance with disclosure requirements incurs the cost for the preparation, dissemination, and assurance of the information (Grewal, Riedl, & Serafeim, 2016). However, these direct costs are likely to decrease with firm size. Larger firms are able to apply economies of scale and introduce more sophisticated reporting systems to ensure the processing of all available information. Accordingly, we apply firm size as a proxy for preparation cost and measure PREPARATION COST as the inverse of the natural logarithm of total assets. As prior studies have found a significant association between preparation cost or firm size and disclosure

compliance levels (e.g., Paananen, 2008; Ettredge et al., 2011; Bepari, Rahman, & Mollik, 2014), we state our first *Hypothesis 1a* as follows:

Hypothesis 1a: Goodwill impairment test related disclosure compliance and disclosure quality are negatively associated with preparation cost.

In case of a non-compliance with disclosure requirements, enforcement and litigation cost arises when non-compliance is detected and sanctioned. The likelihood that an enforcement mechanism detects and sanctions non-compliance depends on the quality of the enforcement environment (Hope, 2003; Boecking et al., 2015). Consequently, within a weak enforcement environment, firms are likely to incur lower enforcement and litigation cost in case of non-compliance than in a stronger enforcement environment. Because we expect firms to embed possible enforcement and litigation cost in their disclosure decisions, we state *Hypothesis 1b* as follows:

Hypothesis 1b: The negative association between preparation cost and compliance quality is more pronounced within a weak enforcement environment.

Proprietary cost

The direct cost of preparing the disclosures are only one part of the cost that disclosure induces. In addition, indirect cost of disclosure in the form of proprietary cost may occur (Verrechia, 1983). One important factor that drives proprietary cost is competition. On the one hand, it can be argued that firms that operate in a highly competitive environment may fear that any information could be useful for competitors, whereas firms in less competitive industries may not take account of their competitors (Verrechia, 1983). On the other hand, Hayes and Lundholm (1996) provide a model that predicts less disclosure in less competitive markets. They argue that managers protect excess profits through nondisclosure, and excess profits are more likely in less competitive markets. Moreover, Darrrough and Stoughton (1990) claim that incumbent firms might discourage market entries by providing more information in more competitive markets. Furthermore, Darrrough (1993) reveals that the type of information and the nature of competition affect managers' disclosure decisions.

It can be concluded that the relationship between competition and disclosure quality appears to be context sensitive (Harris, 1998). Therefore, in addition to a proxy that measures industry competition, we apply a firm-specific proxy that captures the position of the firm within the competition. We apply the persistence of abnormal operating profits away from the industry means (PROPRIETARY COST I) as an industry-specific proxy for competition (Harris, 1998). To do so, we use 10 industry variables as defined by Frankel et al. (2002) and modified for a European setting by Ernstberger et al. (2013). High persistence of abnormal operating profits indicates that competitors are unable to drive profitability down and thus indicates less competition. The applied firm-specific measure for proprietary costs is the within-industry ranking of the firm's profit margin (PROPRIETARY COST II) as a proxy for the firm's specific need to protect its competitive advantage (Nichols, 2009).

In the case of goodwill impairment test related disclosures, we expect that proprietary costs play an important role because the management is providing

information with respect to its expectations regarding future developments, and thus, the proprietary costs are generally higher than they are for other disclosures. In line with prior research, e.g. by Mazzi et al. (2017), we expect that that non-compliance with IAS 36 requirements and poor disclosure quality are associated with proprietary information.

Hypothesis 2a: Goodwill impairment test related disclosure compliance and disclosure quality are negatively associated with a firm's proprietary costs.

Moreover, we argue that boilerplate information is less likely to be harmful to the firm because it lacks firm specificity. Conversely, additional voluntary disclosure in terms of higher disclosure quality might provide useful information for competitors (Mazzi et al., 2017). As a result, we hypothesize that the association between proprietary cost and goodwill impairment test related disclosure quality is more pronounced than the association between proprietary cost and compliance quality.

Hypothesis 2b: The negative association between proprietary cost and disclosure quality is more pronounced than the negative association between proprietary cost and compliance quality.

In line with the rationale behind *Hypothesis 1b*, we expect firms to embed possible enforcement and litigation cost in their disclosure decisions as they face a trade-off between a reduction in proprietary cost and an increasing likelihood of enforcement and litigation cost in case of non-compliance. Since the enforcement and litigation cost can be expected to be lower in a weak enforcement environment (Brown et al., 2014), we state *Hypothesis 2c* as follows:

Hypothesis 2c: The negative association between proprietary cost and compliance quality is more pronounced within a weak enforcement environment.

Growth opportunities

While preparation and proprietary cost offer incentives for non-compliance or the provision of boilerplate disclosures, in line with disclosure and economic theory, firms also have an incentive to reduce information asymmetries in order to decrease their cost of capital. Based on this reasoning, Paugam et al. (2015) and Mazzi et al. (2017) document a negative association between impairment-testing-disclosures and cost of capital based. Consequently and because high growth opportunities are associated with higher risks regarding future development, relying on the unravelling principle, we expect firms with higher growth opportunities to provide better compliance and disclosure quality and state *Hypothesis 3a* as below. We apply the market to book ratio to proxy for growth opportunities (GROWTH OPP).

Hypothesis 3a: Goodwill impairment test related disclosure compliance and disclosure quality are positively associated with growth opportunities.

Since a stronger enforcement environment increases the likelihood that firms are held liable for erroneous and wrong disclosures, we expect a strong enforcement environment to curtail voluntary disclosure and decrease disclosure quality. However, we acknowledge that it could also be argued that a stronger enforcement environment enables firms to use voluntary disclosures as a credible signal to capital markets, in turn, reduces the cost of capital,

and, accordingly offers an incentive to offer higher disclosure quality (in line with the results by Mazzi et al., 2017). We stick with the former explanation and state *Hypothesis 3b* as follows:

Hypothesis 3b: The positive association between growth opportunities and disclosure quality is more pronounced within a weak enforcement environment.

Enforcement environment

ESMA and prior research document significant country-specific differences in goodwill impairment test related disclosure compliance levels (Paananen, 2008; Devalle & Rizatto, 2012; ESMA, 2013b; Glaum et al., 2018). These country-specific differences regarding the output of the financial reporting process may be influenced by a range of factors, e.g., a country's culture or its legal, financing, enforcement, and taxation systems (Brown et al., 2014; Fernandes & Lourenco, 2018). For instance, Glaum et al. (2013) find a positive association between the strength of the enforcement regime and IFRS 3 and IAS 36 related disclosure compliance. In line with prior research and ESMA, we expect the quality of the enforcement environment to matter and state *Hypothesis 4a* as below. We measure ENFORCEMENT by relying on the country-specific scores (for 2008) developed by Brown et al. (2014).

Hypothesis 4a: Goodwill impairment test related disclosure compliance and disclosure quality are positively associated with a country's enforcement quality.

However, since enforcers are primarily concerned about the compliance with the applicable accounting standards (e.g., Brown et al., 2014) and boilerplate disclosures could be considered to be in accordance with IAS 36, we expect the positive association between enforcement quality and compliance quality to be more pronounced than the positive association between enforcement quality and disclosure quality.

Hypothesis 4b: The positive association between enforcement quality and compliance quality is more pronounced than the positive association between enforcement quality and disclosure quality.

4. RESEARCH DESIGN AND SAMPLE

4.1. Compliance score and disclosure quality score

Financial disclosure is an abstract concept that cannot be measured directly because it lacks inherent characteristics by which its intensity or quality might be determined, such as the capacity of an automobile (Wallace & Naser, 1995). Therefore, it is necessary to quantify the level of disclosure and to provide evidence that the measures are valid and reliable by specifying the operational procedures. Hence, following prior research, we apply a disclosure score including clearly defined criteria.

In particular, we construct two different disclosure scores: a compliance score and a quality score. The compliance score only measures the extent of compliance, whereas the quality score looks beyond pure compliance and, additionally, evaluates the quality of the disclosures and the extent of voluntary disclosure. The two scores differ not only in terms of the included items but particularly in terms of the applied coding scheme. To measure compliance, we apply a dichotomous scoring scheme, applying a score of 1 if a disclosure

that is required by IAS 36 is provided and zero otherwise. The scoring scheme of the quality score takes into account that companies may comply with the standard by providing boilerplate information. Therefore, we generally distinguish between boilerplate, i.e. standardized or imprecise information, and voluntarily disclosed entity-specific information that is useful for the addressee. Thus, we extend the scoring scheme and apply a three-stage scale that captures useful (voluntarily disclosed) information with a score of 1, boilerplate information with a score of 0.5 and no information with a score of 0 (see also Izzo, Luciani, & Sartori, 2013, who apply a similar scoring scheme; see Section 3.1 for further details). Furthermore, whereas the compliance score consists only of items that are directly derived from IAS 36 paragraph 130 and 134 (see Table 1 items 1-15)⁴, the quality score additionally contains four items—voluntary disclosures—referring to the quality of the disclosures that are not directly required by IAS 36 (see Table 1 items Q1-Q4 and Section 4.2). Obviously, the compliance score and the quality score are to some extent related to each other. For instance, a high-quality score also indicates a high compliance score (because compliance is a part of quality). However, a high compliance score does not necessarily lead to a high-quality score. Therefore, the difference between disclosure quality and disclosure compliance remains firm and year specific.

4.2. Scoring scheme and additional items of quality score

Because the evaluation of whether a disclosure is boilerplate or if it provides useful information for the addressee may be criticized as subjective, we clearly defined restricted criteria (an overview is provided in Table 1). For items requiring pure disclosure of any values (e.g., the basis on which the recoverable amount has been determined (item 2), growth rate (item 6), discount rate (item 8)), we generally assign a value of zero if the disclosure is missing, a value of 0.5 if the disclosure is on an aggregated level (e.g., not CGU specific) and a value of 1 if CGU-specific information is provided. Items demanding explanations or other verbal descriptions of the management approach are coded as follows: 0 if no information is disclosed and 0.5 if non-entity-specific boilerplate information is provided (e.g., “cash flows are based on budgets approved by management” for item 3 or “the growth rate reflects the average long-term growth rate of the market.” for item 7). Finally, we assign a value of 1 if the disclosures are precise and useful for the addressee⁵

⁴ In addition to the requirements being part of our disclosure score, IAS 36 requires a description of any changes to the aggregation of assets for identification of the CGU (IAS 36.130 (d)(iii)). However, it is not possible to distinguish whether a missing disclosure can be reduced to a non-disclosure of an occurred change or simply to the fact that no change occurred. For this reason, this requirement is excluded from our compliance and quality scores.

⁵ The IASB conceptual framework identifies four qualitative characteristics that enhance the usefulness of information: 1) comparability, 2) verifiability, 3) timeliness, and 4) understandability (IASB CF.QC 19). The quality score predominantly focuses on understandability and verifiability. Comparability with respect to goodwill impairment test related disclosures is an outcome of understandable and verifiable information (see also in a broader context IASB CF.QC 24) and thus is not (directly) considered in the quality score. The score does not evaluate the timeliness of disclosures because most of the goodwill impairment test related disclosures are forward looking, and thus, timeliness is not of prior importance with respect to this information (IASB CF.QC29).

(e.g., “significant deterioration of the economic conditions in country X” or “effects on the forecast cash flows due to a political situation in country Y” for item 11).

For some items, we formulate additional criteria that are useful information for the addressee. Regarding the disclosure of the period over which management has projected the cash flows (item 5); IAS 36.134 (d) (iii) requires an explanation of why a period longer than 5 years is justified. Therefore, in the case of projection periods that exceed 5 years, we assign a value of 1 only if an understandable and entity-specific explanation for a longer projection period is provided. With respect to the explanation for the determination of growth rates, IAS 36.134 (d) (iv) demands a justification for using any growth rate exceeding the long-term average growth rate for the products, industries or countries in which the country operates or for the market to which the unit is dedicated. The ESMA (2013b) states that “using a long-term growth rate exceeding 3% in mature markets might appear ambitious and may lead to an overstated long-term growth [and the ESMA] urges the issuers to provide realistic estimates of future growth rates that correspond to current predictions of the nominal economic growth.” We follow this argumentation and define the threshold for demanding a justification at 3%. Therefore, for disclosures that assume a growth rate equal to or above 3%, we assign a value of 1 only if an entity-specific explanation is provided voluntarily.

In addition to the more comprehensive scoring scheme, the goodwill disclosure quality score contains more items than the compliance score. We additionally include four items that evaluate information that is useful for the addressee but voluntary, i.e. not explicitly required by IAS 36 (Q1-Q4, see Table 1). In particular, the first item Q1 captures whether a link between the segments (or divisions) and CGUs is reported. We argue that this disclosure helps the addressee to understand the level at which the CGUs are defined (ESMA, 2013b) and additionally helps the addressee understand the business model of the CGU.

The second quality-specific item (Q2) evaluates whether the recoverable amount is disclosed. The recoverable amount generally represents the future cash flows (either as VIU or a one-time cash flow as FVLCTS) that could be expected from the evaluated unit (IAS 36.9). Thus, particularly if no goodwill impairment loss is recognized, this disclosure not only includes whether an impairment loss could be recognized in the near future (if the recoverable amount is close to the carrying amount and thus the safety margin is low) but also allows investors to better evaluate the quality of the impairment test. Furthermore, the expectation of management regarding future cash flows is valuable information for (potential) investors or creditors for evaluating the firm.

Table 1. IAS 36's goodwill impairment test disclosure requirements and the disclosure compliance and disclosure quality scores' components

Item No.	Conditional	Category	IAS 36 paragraph	Description	Remarks regarding quality evaluation	
1	-	Allocation of goodwill to Cash Generating Units (CGU)	134 (a)	Allocation of goodwill to CGUs	0 = No allocation of goodwill disclosed; 0.5 = Disclosure of goodwill on aggregated level (e.g. segments) or without clear definition if it is a CGU or a segment; 1 = Allocation on CGU basis disclosed and criteria for allocation is described or clear definition if it is a CGU or a segment is provided	
2	-	Determination of recoverable amount	134 (c)	Disclosure of the basis on which the recoverable amount has been determined	0 = No information is disclosed; 0.5 = Specification if Value in use (VIU) or Fair value less cost to sell (FVLCTS) is applied on aggregated level (no CGU specific disclosure); 1 = CGU-specific disclosure whether VIU or FVLCTS is applied	
3	Only if value in use (VIU) is applied or if fair value less cost to sell (FVLCTS) is based on discounted cash flow calculations	Cash flow projections	134 (d/e) (i)	Description of key assumptions on which management has based its cash flow projections/the determination of fair value less cost to sell	0 = No information disclosed; 0.5 = Boilerplate information or information on aggregated level is disclosed; 1 = CGU-specific and detailed information is disclosed	
4			134 (d/e) (ii)	Description of managements' approach to determining the value(s) assigned to each key assumption	0 = No information disclosed; 0.5 = Boilerplate information is disclosed; 1 = Detailed information of the process of determining the values assigned to the key assumptions or the external source of the key assumptions is disclosed and explanation how and why they differ from past experience or external information is provided (if applicable)	
5			134 (d/e) (iii)	Disclosure of the period over which management has projected cash flows based on financial budgets/forecasts approved by management	0 = No information disclosed 0.5 = Aggregated information is disclosed or missing explanation if projection period exceeds 5 years; 1 = CGU-specific disclosure of applied projection periods including explanation why projection period over 5 years is used (if necessary)	
6		Growth rate	134 (d/e) (iv)	Disclosure of the growth rate used to extrapolate cash flow projections beyond the period covered by the most recent budgets/forecasts	0 = No information disclosed; 0.5 = Disclosure of a range of growth rates without clear allocation to CGUs; 1 = CGU-specific disclosure of applied growth rates	
7			134 (d/e) (i/ii)	Explanation how growth rates are determined	0 = No information disclosed; 0.5 = Boilerplate information, aggregated information or missing explanation why growth rate above 3% is appropriate for different CGUs; 1 = detailed description of determination of growth rates is provided (including: CGU specific assumptions e.g. regarding inflation or economic growth or explanation why growth rate exceeds 3% (if necessary)).	
8		Discount rate	134 (d/e) (v)	Disclosure of the discount rates applied to the cash flow projections for each CGU with significant goodwill	0 = No information disclosed; 0.5 = Disclosure of a range of discount rates without clear allocation to CGUs; 1 = CGU-specific disclosure of discount rates	
9			134 (d/e) (i/ii)	Explanation how discount rates are determined.	0 = No information disclosed; 0.5 = Boilerplate information or aggregated information is disclosed 1 = Detailed description of determination of discount rates is provided (including: CGU-specific disclosure of discount rate components, like beta-factor or risk free rate)	
10		Sensitivity analysis	134 (f) (i-iii)	Disclosure of sensitivity analysis regarding key assumptions	0 = No information disclosed; 0.5 = Boilerplate information; 1 = Detailed information regarding sensitivity analysis or disclaimer that a reasonable change will not lead to an impairment loss is provided	
11		Only if goodwill-impairment is recognized	Disclosures for each material goodwill impairment loss recognized	130(a)	Disclosures of events and circumstances that led to the recognition of a material goodwill impairment loss for each material CGU	0 = No information disclosed; 0.5 = Disclosure of boilerplate information or unspecific information; 1 = Disclosure of specific information (e.g. "significant deterioration of the economic conditions in country X" or "impacts on the forecast cash flows due to political situation in country Y")
12				130(b)	Disclosure of the amount of the impairment loss recognized for each material CGU	0 = No allocation of impairment loss disclosed 0.5 = Disclosure of impairment loss on aggregated Level or 1 = Impairment loss on CGU basis disclosed
13	130(d) (i)			Description of the CGU	0 = No information disclosed; 0.5 = Boilerplate information or only name of CGU (i.e., it is not possible to obtain a clear understanding of the CGU); 1 = Description of the CGU disclosed (e.g. product line; business operation; geographical area or reportable segment) and clear understanding of the CGU is possible	
14	130(d) (ii)			Disclosure of the impairment loss by reportable segment	0 = No information is provided; 0.5 = Information provided within segment reporting (without cross reference) or disclosure is not clear without looking to the segment reporting (e.g. not clear if it is CGU or Segment); 1 = Information provided within the goodwill impairment disclosure or cross reference to segment reporting	
15	130(e)			Disclosure whether the recoverable amount is FVLCTS or VIU	0 = No information disclosed; 0.5 = Information is disclosed on aggregated level (not CGU-specific); 1 = CGU-specific disclosure	
Q1		Additional items of quality score	- (Quality score only)	Is a link between segments (or divisions) and CGUs reported?	0 = No information disclosed; 0.5 = A general link between CGUs and segments is disclosed or a unclearly formulated link is provided (it can only be understood, if segment reporting is studied); 1 = CGU-specific allocation to segments (clearly disclosed; it can be understood without checking the segment reporting)	
Q2			- (Quality score only)	Disclosure of the recoverable amount	0 = No information is disclosed; 0.5 = Disclosure of recoverable amount on aggregated level (e.g. segment) or other incomplete information; 1 = CGU-specific recoverable amount is disclosed	
Q3	only if FVLCTS is applied		- (Quality score only)	Disclosure of the level of the fair value hierarchy within which the fair value measurement is categorized in its entirety	0 = No information is disclosed; 0.5 = Information is disclosed on aggregated level; 1 = CGU-specific information is provided.	
Q4			- (Quality score only)	Accessibility of information	0 = Goodwill impairment test related disclosures in more than two chapters without any cross references; 0.5 = Disclosures in more than two chapters and some cross references are provided; 1 = Information in less than three chapters or complete cross references are provided	

The disclosure of the level of the fair value hierarchy within which the fair value measurement is categorized in its entirety is captured by item Q3. Because the IASB modified IAS 36 as a consequence of issuing IFRS 13 in 2011⁶, this disclosure is required by IAS 36.134 (e) (iiA). The rationale of these amendments was to ensure that IAS 36 is consistent with the disclosure requirements of IFRS 13 and with disclosures about impaired assets under US-GAAP (IASB, 2012).⁷ We believe that this disclosure is useful information for the addressee. However, our sample period covers only 2011 and 2012; therefore, we do not require this disclosure for the compliance score, but we implemented it in the quality score.

The fourth additional item referring to disclosure quality captures the accessibility of goodwill impairment test disclosures (Q4). We use a combination of text passages (e.g., chapters) referring to goodwill impairment testing and cross-references between different text passages. To gather goodwill impairment test related information, we expect a competent reader to (at least) look up the notes relating to goodwill (or intangible assets) and the principal accounting principles. Therefore, we assign 1 point if the information is provided in less than three text passages or complete cross-references to all other relevant text passages are provided. A value of 0.5 is assigned if a goodwill impairment test related disclosures are provided in three or more text passages and only incomplete cross-references are provided. Finally, we assign a value of 0 if three or more text passages address goodwill impairment related disclosures and no cross-references are provided.

4.3. Calculation of the overall goodwill impairment test disclosure score

Some items in our compliance and quality scores are applicable only under certain conditions. Q3 is only relevant for companies that apply the FVLCTS method, items 3-10 are not required if the FVLCTS is based on market values, and items 11-15 are required only if a material goodwill impairment loss has been recognized during the period (IAS 36.130).⁸ Therefore, following prior research, we adjust the maximum achievable compliance score and quality score for non-applicable items on the firm-year level. Furthermore, we calculate unweighted scores. This implies that each item is of the same importance for each addressee. We acknowledge that this assumption might be challenged. However, we follow the argumentation of Lopes and Rodrigues (2007)

that the bias resulting from this assumption is smaller than adding additional subjectivity by assigning different weights to the items. The calculation of the final compliance and quality score is shown in Equation 1. The variables are defined in the Appendix.

$$DSCORE_{i,t} = \frac{\sum_{j=1}^m a_{j,i,t} * d_{j,i,t}}{\sum_{j=1}^m a_{j,i,t}} \quad (1)$$

4.4. Validity and reliability

Self-designed metrics, such as our compliance and disclosure quality scores, are regularly criticized because they involve subjective judgment in their construction and evaluation, and thus, the results may be difficult to replicate and generalize. In particular, the limited validity (e.g., subjective items, subjective weighting) and limited reliability (subjective coding) are heavily criticized (Beyer et al., 2010). Consequently, the applied coding method needs to be reliable for valid conclusions to be drawn (Dobler, Lajili, & Zéghal, 2011).

To reach sufficient reliability, in a first step, the authors individually evaluated the appropriateness of the item-specific descriptions of the initial compliance and disclosure quality score based on 5 randomly selected annual reports and afterward refined the score descriptions. In a second step, we provided the coders (experienced graduate students) with very precise coding instructions (see Table 1) and extensively explained the desired coding procedure to prevent different coding of the same disclosure. After these instructions, we randomly selected another 10 reports of our sample, and each of the authors and the other coders independently analyzed these reports. The results did not differ significantly, yielding a sufficient level of inter-coder reliability (a similar approach was applied by Dobler, Lajili, & Zéghal, 2011). Furthermore, the coders were asked to contact one of the authors if any ambiguity in the coding scheme occurred. In those cases, all coders were contacted to resolve the ambiguity.

As mentioned, the limited validity of self-constructed metrics is also regularly criticized. However, the compliance score exclusively consists of items that are directly derived from the requirements of IAS 36. The additional quality score items and the criteria of quality evaluation are based on statements of the enforcement authorities or planned or issued amendments of IAS 36. Moreover, we do not apply any subjective weighting in calculating our final scores. Furthermore, we provide a robustness check showing that the elimination of the additional quality items does not change the results significantly. Therefore, we are confident that our results exhibit sufficient validity.

4.5. Descriptive, univariate and multivariate analysis

To test our hypotheses, as a first step, we run the regressions shown in Equation 2 with heteroscedasticity robust standard errors. The dependent variable (DSCORE) represents either the firm year-specific disclosure compliance quality score (CQSCORE) or the disclosure quality score (DQSCORE) calculated according to Equation 1. In a second step, we run the regressions shown in

⁶ Those amendments must be applied when a company applies IFRS 13 (IAS 36.140I). The effective date of IFRS 13 was January 1, 2013 (IFRS 13.C1).

⁷ In the course of those modifications of IAS 36, the IASB also included paragraph 134 (e)(iiB) demanding disclosure of a change in the valuation technique and the reason for the change if there has been a change. However, it is not possible to evaluate whether missing disclosures can be reduced to the non-disclosure of a change or simply no change of valuation technique. Therefore, we decided to not implement this disclosure in our quality score. This disclosure is only required if the FVLCTS is applied to measure the recoverable amount.

⁸ In our main analysis, we assume that any reported impairment loss is material unless it is explicitly stated within the notes that the goodwill impairment loss is immaterial or if less than 1% of the goodwill recognized at the beginning of the period is impaired. We define a relatively strict threshold because minor goodwill impairment loss compared to total goodwill may still affect a CGU as a whole.

Equation 2 separately for firms within a weak and strong enforcement environment. We built on the enforcement quality score developed by Brown et al. (2014). The enforcement quality score is a weighted, country-specific score consisting of six different items (e.g., the body reviews financial statements; the body provides a report on its review of financial statements; Brown et al., 2014). We applied the latest available score (for 2008) as our enforcement activity proxy. We also conduct a median split to distinguish between countries with a weak and a strong enforcement environment. When running the regression in the two subsamples, we refrain from additionally controlling for ENFORCEMENT.

The independent variables consist of the variables referring to our hypotheses (variables referring to $\beta_1 - \beta_5$). Furthermore, we include several control variables. Following Petersen and Plenborg (2010), and Bepari, Rahman and Mollik (2014), we control for goodwill intensity (MATERIALITY GW) and expect it to be positively associated with disclosure compliance and quality. Based on the same rationale, we control for the magnitude of goodwill impairment losses (MATERIALITY IMP). Another firm characteristic that is linked to materiality and may influence disclosure behaviour is a book value of net assets that exceeds the market value of equity (market to book value (MTBV) <1). According to IAS 36, this serves as an indicator that goodwill might be impaired (IAS 36.12(d), ESMA, 2013b). Thus, it is likely that market participants expect firms that show an MTBV below 1 to record goodwill impairment losses. In turn, if those firms do not record goodwill impairment losses, they should be expected to provide comprehensive disclosures on goodwill impairment testing (Mazzi et al., 2017). Accordingly, we employ a dummy variable MATERIALITY TRIGGER that takes the value of 1, if a firm shows an MTBV below 1 but did not record an impairment loss. Moreover, we control for firm profitability (ROA) as more profitable firms might be willing to provide more information for signalling purposes (Bepari, Rahman, & Mollik, 2014). We control for leverage (LEV) because non-compliance with the applicable accounting standards can result in debt covenant breaches. MULTINATIONAL is included to control for the proportion of foreign sales in accordance with prior research since multinational companies that seek access to foreign (capital) markets may be subject to several regulatory authorities and reviews (Lopes &

Rodrigues, 2007; Street & Bryant, 2000; Street & Gray, 2002). In addition to these firm characteristics, prior research has shown that governance mechanisms are likely to affect compliance and disclosure decisions. We control for AUDIT ENVIRONMENT (the applied audit environment score is a weighted, country-specific score consisting of nine different items (e.g., auditors must be licensed, a quality assurance program is in place; Brown et al., 2014). We used the latest available score (for 2008) as our audit environment proxy) since a higher audit quality might be associated with better compliance with the applicable accounting standards. Furthermore, we control for BIG4 as prior research shows that audits conducted by one of the BIG4 audit firms show a higher audit quality than do audits by smaller audit firms (e.g., Francis, 2004; DeFond & Francis, 2005; Lin & Hwang, 2010; Lennox & Pittman, 2010). Next, we control for BOARD SKILLS and BOARD EXPERIENCE as directors need to be financially literate and understand the habits of the industry to prepare disclosures and to evaluate their compliance with mandatory goodwill impairment test related disclosures requirements (Fernandes & Lourenco, 2018). Moreover, based on prior literature indicating that there is a positive association between concentrated ownership and information asymmetry (entrenchment theory; Shleifer & Vishny, 1997; Morck, Shleifer, & Vishny, 1988; Leuz, Nanda, & Wysocki, 2003; Verriest & Gaeremynck, 2009), we include the percentage of total shares available to ordinary investors (NOSHFF) as a proxy for concentrated ownership structure. Furthermore, since firms that are, additionally, subject to SEC enforcement might change their disclosure behaviour, we embed a control for firms cross-listed at the NYSE.

Finally, we add year controls because the collected data refers to the fiscal years 2011-2012. We do not explicitly control for industries because PROFIT PERS represents the industry-specific competition, and thus, separate control for the industry is not necessary. Due to the same rationale, we do not explicitly control for the country because AUDIT ENVIRONMENT and ENFORCEMENT are country-specific variables in our main model. However, to rule out any country effects despite a similar quality of the audit and enforcement environment, we additionally run (and tabulate) our model including country controls.

$$\begin{aligned} \text{DScore}_{i,t} = & \alpha + \beta_1 \text{PREPARATION COST}_{i,t} + \beta_2 \text{PROPRIETARY COST I}_{i,t} + \beta_3 \text{PROPRIETARY COST II}_{i,t} + \\ & \beta_4 \text{GROWTH OPP}_{i,t} + \beta_5 \text{ENFORCEMENT}_{i,t} + \beta_6 \text{MATERIALITY GW}_{i,t} + \beta_7 \text{MATERIALITY IMP}_{i,t} + \\ & \beta_8 \text{MATERIALITY TRIGGER}_{i,t} + \beta_9 \text{ROA}_{i,t} + \beta_{10} \text{LEV}_{i,t} + \beta_{11} \text{MULTINATIONAL}_{i,t} \\ & + \beta_{12} \text{BOARD SKILLS}_{i,t} + \beta_{13} \text{BOARD EXP}_{i,t} + \beta_{14} \text{NOSHFF}_{i,t} + \beta_{15} \text{AUDIT ENVIRONMENT}_{i,t} + \beta_{16} \text{BIG4}_{i,t} + \\ & \beta_{17} \text{NYSE}_{i,t} + \text{Year Controls} + \epsilon_{i,t} \end{aligned} \quad (2)$$

4.6. Sample description

Our initial sample consists of all STOXX Europe 600 companies as of December 2012, covering consolidated financial statements from 2011 and 2012 (1200 firm-years, see Table 2). The STOXX Europe 600 Index represents large, mid and small capitalization companies across 17 countries (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal,

Spain, Sweden, Switzerland and the United Kingdom) of the European region and is neither limited to the EU or Eurozone.⁹ As a next step, we downloaded the firms' consolidated financial statements from the respective websites and obtained data from Thomson Reuters' Datastream. We excluded all firms for which no IFRS financial statements or no IFRS financial statements in English were available

⁹ Further information is available at <https://www.stoxx.com/index-details?symbol=SXXP>.

(34 firm-years) and discarded all companies that reported no significant goodwill (goodwill is defined to be insignificant if it amounts to 1% of lagged total assets or less; 278 firm-years). Next, we dropped 19 observations with a negative MTBV (firms in financial distress) because the interpretation of a negative MTBV is not consistent with the interpretation of a positive one (usually a MTBV below 1 is interpreted as an indicator that goodwill may be impaired because the market value exceeds the book value of equity. A negative MTBV indicates that although the book value of equity is negative,

the market value is positive, and thus, the market value exceeds the book value. This is not consistent with the interpretation that a low MTBV is associated with goodwill impairments). This procedure leads to a sample of 864 annual reports by which goodwill impairment related disclosures could be evaluated. Of these observations, 700 (81.02%) did not recognize a material impairment loss and 164 (18.98%) did. Subtracting observations with missing values in regression variables (210 observations), we end up with 654 observations for our multivariate analysis.

Table 2. Sample construction process

	<i>Firm years</i>
EUROSTOXX 600 firms (as listed at 31 December 2012) for financial years 2011 and 2012	1200
Less: firm years with no IFRS financial statement or no IFRS financial statement in English available	34
Less: firm years reporting no significant goodwill*	278
Less: firm years with negative MTBV	19
Disclosure analysis sample	864
Firm years with significant goodwill impairment**	164 (18.98%)
Firm years without significant goodwill impairment	700 (81.02%)
Less: firm years with missing values in regression variables	210
Final sample of multivariate analysis	654
* goodwill is defined to be insignificant if it amounts to 1% of lagged total assets or less	
** goodwill impairment is defined to be insignificant if it amounts to 1% of lagged goodwill or less, 58 goodwill impairments were treated as insignificant due to this constraint	

5. EMPIRICAL RESULTS AND SENSITIVITY ANALYSIS

5.1. Descriptive statistics

Table 3 provides descriptive statistics with respect to our regression variables. The disclosure compliance score (CQSCORE), on average, amounts to 85.78%, and the quality score (DQSCORE) shows a mean of 62.63%. Unsurprisingly, the mean compliance score is higher than the mean quality score because boilerplate information is sufficient to reach compliance but does not lead to a high-quality score. The descriptive statistics also indicate that our sample shows sufficient variation in the variables referring to our hypotheses (PREPARATION COST, PROPRIETARY COST I and II, GROWTH OPP and ENFORCEMENT).

Regarding the goodwill position in the financial statements of our sample firms, the goodwill

intensity (MATERIALITY GW) ranges from 0.0109 to 0.6628 with an average of 0.2035, and the average goodwill impairment magnitude (MATERIALITY IMP) amounts to 0.0217 with a maximum of 0.5433 (the average goodwill impairment magnitude amounts to 0.1153 if only the 164 goodwill-impairers within our sample are considered). The descriptive results regarding MATERIALITY TRIGGER show that 9.45% of firms within our sample did not recognize an impairment loss although their book value of equity exceeded their market value (an MTBV <1). The considerably high standard deviations of MATERIALITY GW and MATERIALITY IMP show that there is also a high variation with respect to goodwill accounting in our sample. Considering our other control variables, except BIG4, all variables exhibit considerably high variation as well. However, about 96% of the financial reports in our sample are audited by a BIG4 audit firm.

Table 3. Descriptive statistics of regression variables

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>Std.Dev.</i>	<i>Min</i>	<i>Max</i>
CQSCOREe	864	0.8578	0.1602	0.1000	1.0000
DQSCORE	864	0.6263	0.1351	0.1071	0.9286
PREPARATION COST	864	-16.1405	1.6713	-21.2647	-11.7623
PROPRIETARY COST I	864	0.6399	0.1549	0.3908	0.9203
PROPRIETARY COST II	860	0.4908	0.2802	0.0227	1.0000
GROWTH OPP	857	2.8062	3.0066	0.3200	20.9300
ENFORCEMENT	860	18.6221	4.2399	8.0000	22.0000
MATERIALITY GW	861	0.2035	0.1569	0.0109	0.6628
MATERIALITY IMP	862	0.0217	0.0789	0.0000	0.5433
MATERIALITY TRIGGER	857	0.0945	0.2927	0.0000	1.0000
ROA	861	0.0640	0.0688	-0.1523	0.4304
LEV	864	0.6019	0.1795	0.1443	0.9634
MULTINATIONAL	835	64.9152	29.4245	0.0000	100.0000
BOARD SKILLS	725	46.6040	20.9756	0.0000	100.0000
BOARD EXP	679	6.5083	2.4838	2.0000	15.2800
NOSHFF	858	75.9312	22.0169	8.0000	100.0000
AUDIT ENVIRONMENT	860	27.3058	3.9246	17.0000	32.0000
BIG4	864	0.9618	0.1918	0.0000	1.0000
NYSE	864	0.0787	0.2694	0.0000	1.0000

Note: All variables are defined in the Appendix.

In Table 4, we disaggregated our descriptive statistics into subsamples. Comparing firm years with and without a material goodwill impairment, we find that firm years with goodwill impairments show significantly higher disclosure quality scores, lower preparation cost (bigger firm size), lower proprietary cost (in one of the two applied measures), and lower growth opportunities. Comparing firm years within a strong and weak enforcement environment (the median split using ENFORCEMENT splits our sample into 299 and 355 firm year observation. This is due to Germany's enforcement score representing the median and firm years from German firms were consistently treated as observations within a strong enforcement environment (see also Section 5.4)), we

find that firm years within a strong enforcement environment show significantly higher disclosure compliance and quality scores, higher preparation cost (smaller firm size) as well as higher proprietary cost (in one of the two applied measures), and higher growth opportunities. Moreover, we find significant differences in many of our control variables. While those descriptive results are mostly in line with expectations and unsurprising, they emphasize the necessity of subsample analyzes. Therefore, in addition to the subsamples analysis considering the enforcement environment, as a robustness check, we also analyze firm years with and without material goodwill impairments separately.

Table 4. Descriptive statistics of regression variables for subsamples

Variable	Firm years without impairment		Firm years with impairment		Test of differences		Weak enforcement environment		Strong enforcement environment		Test of differences	
	N	Mean	N	Mean	Difference	t-value	N	Mean	N	Mean	Difference	t-value
CQSCORE	700	0.8589	164	0.8533	0.01	0.40	299	0.8523	355	0.8809	-0.0287*	(-2.39)
DQSCORE	700	0.6220	164	0.6449	-0.0230*	(-1.96)	299	0.6190	355	0.6418	-0.0227*	(-2.20)
PREPARATION COST	700	-15.9943	164	-16.7646	0.770***	5.40	299	-16.7953	355	-15.8346	-0.961***	(-7.60)
PROPRIETARY COST I	700	0.6350	164	0.6605	-0.03	(-1.90)	299	0.6357	355	0.6350	0.0006	0.05
PROPRIETARY COST II	696	0.5205	164	0.3651	0.155***	6.54	299	0.4605	355	0.5269	-0.0664**	(-3.07)
GROWTH OPP	693	2.9632	164	2.1427	0.821**	3.16	299	2.1829	355	3.2994	-1.117***	(-5.01)
MATERIALITY GW	699	0.2037	162	0.2026	0.00	0.08	299	0.1859	355	0.2181	-0.0322**	(-2.62)
MATERIALITY IMP	700	0.0000	162	0.1153	-0.115***	(-20.41)	299	0.0258	355	0.0175	0.0083	1.4
MATERIALITY TRIGGER	693	0.1169	164	0.0000	0.117***	4.65	299	0.1405	355	0.0563	0.0841***	3.69
ROA	697	0.0722	164	0.0295	0.0426***	7.36	299	0.0499	355	0.0793	-0.0294***	(-5.96)
LEV	700	0.5935	164	0.6377	-0.0442**	(-2.85)	299	0.6281	355	0.5869	0.0412**	3.07
MULTINATIONAL	679	66.5104	156	57.9719	8.539**	3.29	299	65.8203	355	64.1796	1.6410	0.71
BOARD SKILLS	579	47.6360	146	42.5112	5.125**	2.65	299	40.2915	355	52.0260	-11.73***	(-7.55)
BOARD EXP	547	6.5606	132	6.2914	0.27	1.12	299	6.9804	355	6.1534	0.827***	4.26
NOSHFF	695	76.5626	163	73.2393	3.32	1.74	299	70.4248	355	83.1127	-12.69***	(-7.73)
AUDIT ENVIRONMENT	697	27.3314	163	27.1963	0.14	0.40	299	25.7926	355	28.9690	-3.176***	(-11.22)
BIG4	700	0.9629	164	0.9573	0.01	0.33	299	0.9465	355	0.9859	-0.0394**	(-2.86)
NYSE	700	0.0729	164	0.1037	-0.03	(-1.32)	299	0.0936	355	0.0958	-0.0021	(-0.09)

Note: The table reports the descriptive statistics separately for firm years with and without goodwill impairments and for firm years within a strong and within weak enforcement environment. We conduct a media split using the variable ENFORCEMENT to distinguish between a weak and strong enforcement environment. As Germany represents the median, we allocated all firm-year observations from German firms to a strong enforcement environment. We run two sample t-tests with equal variances to compare the two groups in each of the subsamples. *, **, *** denote t-value significance at the 10, 5, and 1% level.

5.2. Compliance and item-specific analysis

To make sure that our compliance and disclosure quality scores are not driven by a single item, we conducted an item-specific analysis. We find that only 273 of the 864 analyzed reports (31.6%) comply with all items of the compliance score that are relevant for the individual firm year (not tabulated). Particularly, considering the fact that all financial reports in our sample received an unqualified audit opinion, the overall lack of compliance is remarkable. However, 704 annual reports (81.48%) comply with at least 80% of the relevant items, and only 24 firm years (2.78%) do not comply with at least 50% of the relevant items.

Table 5 provides the item-specific compliance and disclosure quality levels. The item-specific compliance levels range from 62.80% (disclosure of the impairment loss by reportable segment) to 96.76% (allocation of goodwill to CGUs). Focusing on items that are relevant irrespective of whether an impairment loss is recognized during the period, the

explanation of how growth rates are determined shows the lowest compliance level (64.97%). However, the non-compliance is not concentrated on one specific item or disclosure requirement.

The bandwidth of the item-specific disclosure quality score is much wider and reaches from 14.99% (disclosure of the recoverable amount) to 89.47% (allocation of goodwill to CGUs). Furthermore, it can be found that in many cases, the disclosure quality score is considerably lower than the corresponding average compliance score. This result indicates that the compliance score is to some extent driven by boilerplate information. This difference between compliance and disclosure quality is particularly evident in the cases of explanations of how growth rates or discount rates are determined and in the cases of descriptions regarding the key assumptions and management's approach in determining the values assigned to each key assumption. Furthermore, the quality score of disclosures regarding the sensitivity analysis deviates considerably from the compliance score.

Table 5. Item-specific compliance quality and disclosure quality levels

Item No.	Variable	CQSCORE			DQSCORE		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
1	Allocation of Goodwill to Cash Generating Units (CGU)	864	0.9676	0.1772	864	0.8947	0.2405
2	Disclosure of the basis on which the recoverable amount has been determined	864	0.9572	0.2026	864	0.8808	0.2586
3	Description of Key Assumptions on which management has based its cash flow projections/ the determination of fair value less cost to sell	864	0.8819	0.3229	864	0.625	0.3256
4	Description of managements approach to determining the value(s) assigned to each key assumption	864	0.6921	0.4619	864	0.4248	0.3328
5	Disclosure of the period over which management has projected cash flows based on financial budgets/ forecasts approved by management)	862	0.9385	0.2404	862	0.7877	0.3032
6	Disclosure of the growth rate used to extrapolate cash flow projections beyond the period covered by the most recent budgets/forecasts	862	0.8875	0.3162	862	0.721	0.3436
7	Explanation how growth rates are determined	862	0.6497	0.4774	862	0.373	0.3092
8	Disclosure of the discount rates applied to the cash flow projections for each CGU with significant goodwill	862	0.964	0.1863	862	0.8005	0.2793
9	Explanation how discount rates are determined	862	0.8422	0.3647	862	0.4669	0.2477
10	Disclosure of sensitivity analysis regarding key assumptions or of disclaimer, that a reasonable change will not lead to an impairment loss	864	0.8565	0.3508	864	0.5451	0.304
11	Disclosures of events and circumstances that led to the recognition of a material goodwill impairment loss for each material CGU	164	0.7256	0.4476	164	0.6189	0.4285
12	Disclosure of the amount of the impairment loss recognized for each material CGU	164	0.9573	0.2028	164	0.8841	0.2574
13	Description of the CGU	164	0.8659	0.3419	164	0.5427	0.2952
14	Disclosure of the impairment loss by reportable segment	164	0.628	0.4848	164	0.5335	0.4504
15	Disclosure whether the recoverable amount is Fair value less cost to sell (FVLCTS) or Value in use (VIU)	164	0.8049	0.3975	164	0.7713	0.4007
Q1	Is a link between segments (or divisions) and CGUs reported?				864	0.5891	0.403
Q2	Disclosure of the recoverable amount				864	0.1499	0.2845
Q3	Disclosure of the level of the fair value hierarchy within which the fair value measurement is categorized in its entirety				208	0.6322	0.4291
Q4	Accessibility of information				864	0.8594	0.2912

5.3. Correlation analysis

To gain an initial understanding of the determinants of both goodwill impairment test related disclosure compliance and disclosure quality, we conduct a correlation analysis as provided in Table 6. Unsurprisingly, the compliance score and the disclosure quality score are positively correlated with each other (significant at the 1% level). This result might be interpreted based on the fact that both scores are similarly constructed and share many items. However, compliance with regulatory requirements is an important factor in high-quality disclosures, and we showed in Section 5.2 that both scores differ particularly with respect to specific items. PREPARATION COST is significantly negatively correlated (at the 1% level) with both scores, suggesting that lower preparation cost tend to increase the compliance with disclosure requirements and the quality of disclosures. The proxies referring to proprietary costs are both

significantly and negatively correlated with each of the scores (at the 1% level, with the exception of PROPRIETARY COST I and the compliance score (5% level)). The results are in line with our hypotheses and indicate that firms that face the need to protect their competitive advantage in less competitive markets provide less mandatory and voluntary disclosure regarding the goodwill impairment test. However and inconsistent with our expectations, we find growth opportunities negatively associated with both scores while the correlation is insignificant. For enforcement, we find results consistent with our hypotheses, as the association with both scores is positive and significant (at the 1% and 5 % level, respectively).

Given the high correlations among some of the control variables, before running the multivariate analysis, we tested for multicollinearity. However, the test results [variance inflation factor (VIF) < 10, tolerance > 0.1] indicate that the model does not face multicollinearity problems.

Table 6. Correlation matrix (Part 1)

	CQSCORE	DQSCORE	PREPARATION COST	PROPRIETARY COST I	PROPRIETARY COST II	GROWTH OPPORTUNITIES	ENFORCEMENT ENVIRONMENT	MATERIALITY GW	MATERIALITY IMP	MATERIALITY TRIGGER	ROA	LEV	MULTINATIONAL	BOARD SKILLS	BOARD EXP	NOSHFF	AUDIT ENVIRONMENT	BIG4	NYSE
CQSCORE	1.00																		
DQSCORE	0.75 (0.00)	1.00																	
PREPARATION COST	-0.20 (0.00)	-0.21 (0.00)	1.00																
PROPRIETARY COST I	-0.09 (0.03)	-0.13 (0.00)	0.04 (0.27)	1.00															
PROPRIETARY COST II	-0.11 (0.00)	-0.14 (0.00)	0.18 (0.00)	0.03 (0.48)	1.00														
GROWTH OPP	-0.01 (0.81)	-0.04 (0.37)	0.35 (0.00)	-0.01 (0.86)	0.32 (0.00)	1.00													
ENFORCEMENT	0.11 (0.00)	0.09 (0.02)	0.28 (0.00)	-0.02 (0.56)	0.09 (0.02)	0.14 (0.00)	1.00												
MATERIALITY GW	0.16 (0.00)	0.15 (0.00)	0.24 (0.00)	-0.10 (0.01)	0.05 (0.22)	0.02 (0.63)	0.11 (0.01)	1.00											
MATERIALITY IMP	0.05 (0.19)	0.11 (0.01)	-0.13 (0.00)	-0.02 (0.65)	-0.18 (0.00)	-0.07 (0.06)	-0.03 (0.50)	-0.00 (0.93)	1.00										
MATERIALITY TRIGGER	0.03 (0.44)	0.01 (0.73)	-0.24 (0.00)	0.03 (0.49)	-0.24 (0.00)	-0.23 (0.00)	-0.11 (0.00)	-0.14 (0.00)	-0.09 (0.02)	1.00									

Table 6. Correlation matrix (Part 2)

	CQSCORE	DQSCORE	PREPARATION COST	PROPRIETARY COST I	PROPRIETARY COST II	GROWTH OPPORTUNITIES	ENFORCEMENT ENVIRONMENT	MATERIALITY GW	MATERIALITY IMP	MATERIALITY TRIGGER	ROA	LEV	MULTINATIONAL	BOARD SKILLS	BOARD EXP	NOSHFF	AUDIT ENVIRONMENT	BIG4	NYSE
ROA	-0.09	-0.13	0.44	-0.05	0.59	0.55	0.15	0.01	-0.28	-0.23	1.00								
	(0.02)	(0.00)	(0.00)	(0.16)	(0.00)	(0.00)	(0.00)	(0.83)	(0.00)	(0.00)									
LEV	0.09	0.06	-0.36	0.12	-0.30	0.06	-0.07	-0.13	0.00	0.03	-0.37	1.00							
	(0.02)	(0.11)	(0.00)	(0.00)	(0.00)	(0.10)	(0.08)	(0.00)	(0.95)	(0.49)	(0.00)								
MULTINATIONAL	0.21	0.21	-0.07	-0.12	0.03	-0.08	-0.07	0.07	0.02	-0.08	0.04	-0.25	1.00						
	(0.00)	(0.00)	(0.09)	(0.00)	(0.50)	(0.04)	(0.09)	(0.08)	(0.59)	(0.05)	(0.25)	(0.00)							
BOARD SKILLS	0.03	0.04	0.23	0.11	0.12	0.08	0.25	0.05	-0.06	-0.12	0.17	-0.09	-0.09	1.00					
	(0.47)	(0.27)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.21)	(0.15)	(0.00)	(0.00)	(0.03)	(0.02)						
BOARD EXP	0.01	-0.04	-0.09	0.09	0.10	0.07	-0.14	-0.05	-0.11	0.04	0.08	-0.09	0.05	-0.04	1.00				
	(0.74)	(0.32)	(0.02)	(0.03)	(0.01)	(0.06)	(0.00)	(0.23)	(0.01)	(0.26)	(0.03)	(0.02)	(0.22)	(0.27)					
NOSHFF	0.20	0.16	0.13	0.10	-0.02	0.04	0.19	0.14	0.04	-0.06	0.06	-0.01	0.10	0.15	-0.12	1.00			
	(0.00)	(0.00)	(0.00)	(0.01)	(0.64)	(0.36)	(0.00)	(0.00)	(0.28)	(0.12)	(0.13)	(0.85)	(0.01)	(0.00)	(0.00)				
AUDIT ENVIRONMENT	0.08	0.08	0.26	0.09	0.16	0.16	0.52	0.19	0.00	-0.09	0.16	-0.05	-0.07	0.39	-0.08	0.25	1.00		
	(0.03)	(0.05)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.93)	(0.02)	(0.00)	(0.21)	(0.09)	(0.00)	(0.05)	(0.00)			
BIG4	0.09	0.09	-0.09	-0.07	0.06	0.06	0.07	0.00	-0.05	-0.00	0.09	-0.01	0.01	0.09	-0.01	0.04	0.02	1.00	
	(0.02)	(0.02)	(0.02)	(0.07)	(0.16)	(0.11)	(0.08)	(0.94)	(0.17)	(0.99)	(0.02)	(0.89)	(0.80)	(0.02)	(0.81)	(0.34)	(0.54)		
NYSE	0.12	0.15	-0.27	-0.12	0.04	-0.02	0.06	-0.02	0.09	0	-0.05	0.04	0.13	0	0.02	0.1	0	0.06	1
	(0.00)	(0.00)	(0.00)	(0.00)	(0.27)	(0.64)	(0.10)	(0.59)	(0.03)	(0.96)	(0.23)	(0.33)	0	(0.92)	(0.69)	(0.01)	(0.94)	(0.13)	

Note: P-values are reported in parentheses. All variables are defined in the Appendix.

5.4. Multivariate analysis

Table 7 shows the regression results running Equation 2 for the full sample. As expected in *Hypothesis 1a*, higher preparation cost are significantly (at the 1% level) and negatively associated with disclosure compliance and disclosure quality, indicating that larger firms are able to implement more sophisticated information systems and benefit from economies of scale. With respect to proprietary cost, *Hypotheses 2a*, the results show that our proxies PROPRIETARY COST I and PROPRIETARY COST II are negatively associated with both disclosure compliance and disclosure quality. In accordance with *Hypothesis 2b*, the results are more pronounced in terms of higher magnitude and at higher statistical significance levels for the association between proprietary cost and the disclosure quality score. The negative associations between the industry-specific measure PROPRIETARY COST I and the firm-specific measure PROPRIETARY COST II and the compliance quality score are insignificant and significant at the 10% level, respectively. The negative associations between PROPRIETARY COST I and the PROPRIETARY COST II and the disclosure quality score are significant at the 5% and 1% level, respectively. This indicates that proprietary cost plays a more important role for voluntary entity-specific information. Nevertheless, to some extent, managers consider even boilerplate information as being too sensitive for disclosure if, in particular firm-specific, proprietary cost is high. Overall, the result of the correlation analysis, that firms facing the need to protect their competitive advantage in less competitive markets provide less information regarding the goodwill impairment test, is supported also by the multivariate analysis. Regarding *Hypothesis 3a*, GROWTH OPP is positively and significantly at the 10% level associated with disclosure compliance and positively and significantly at the 5% level with disclosure quality. When adding country controls to the regression model, the statistical significance levels increase to 5% and 1% level, respectively. This result is in line with our *Hypothesis 3a* and shows that fast-growing and, thus, riskier firms provide better compliance and more entity-specific information regarding

impairment testing. However, since fast-growing firms are not considered likely to incur goodwill impairments, we run our analysis separately for firm years with and without impairment losses as a sensitive analysis later on. Considering *Hypotheses 4a* and *4b* the results are also in line with our expectations. As expected in *Hypothesis 4a*, ENFORCEMENT, a score that measures the enforcement activities and quality of a country's enforcement system (Brown et al., 2014), is significantly and positively associated with both compliance quality (1% level) and disclosure quality (5% level). In line with prior research, this indicates that firms in countries with a higher quality of enforcement show more transparent disclosures regarding goodwill impairment testing. The economic and statistical significance is higher for the association between ENFORCEMENT and the compliance quality score than for the association between ENFORCEMENT and the disclosure quality score. This supports our *Hypothesis 4b*. Enforcers are more concerned about the compliance with the applicable accounting standards than the actual quality of the disclosures and the extent of voluntary disclosure. We note that the coefficient for ENFORCEMENT becomes insignificant when adding country controls. This is unsurprising, as ENFORCEMENT (and AUDIT ENVIRONMENT) represents a country level score.

With respect to our control variables, goodwill intensity is significantly positively associated with compliance quality and disclosure quality. The magnitude of the goodwill impairment is not significantly related to the disclosure strategy of a firm. Moreover, it is noteworthy, that both BIG4 and AUDIT ENVIRONMENT are insignificant. NOSHFF is significantly and positively associated with both compliance and disclosure quality. This indicates that the more small shareholders are in place, the higher are both disclosure compliance and disclosure quality. In turn and in line with the entrenchment theory and prior research, insiders and major shareholders appear to hold back information to gain an information advantage over smaller shareholders. However, after adding country controls, the association between NOSHFF and the disclosure quality score becomes insignificant (p-value of 0.1315).

Table 7. Multivariate results for our main model (Part 1)

	<i>Predicted association</i>	<i>CQSCORE</i>	<i>CQSCORE</i>	<i>DQSCORE</i>	<i>DQSCORE</i>
PREPARATION COST	-	-0.0271*** (0.0000)	-0.0388*** (0.0000)	-0.0236*** (0.0000)	-0.0316*** (0.0000)
PROPRIETARY COST I	-	-0.0554 (0.2305)	-0.0595 (0.1891)	-0.0773** (0.0255)	-0.0821** (0.0154)
PROPRIETARY COST II	-	-0.0626* (0.0655)	-0.0578* (0.0768)	-0.0652*** (0.0060)	-0.0611*** (0.0072)
GROWTH OPP	+	0.0050* (0.0623)	0.0068** (0.0152)	0.0050** (0.0116)	0.0061*** (0.0033)
ENFORCEMENT	+	0.0050*** (0.0030)	0.0302 (0.2070)	0.0031** (0.0181)	-0.0007 (0.9678)
MATERIALITY GW	+	0.1902*** (0.0000)	0.2209*** (0.0000)	0.1478*** (0.0000)	0.1677*** (0.0000)
MATERIALITY IMP	+	0.0235 (0.7124)	-0.0249 (0.7115)	0.0756 (0.2522)	0.0274 (0.6823)
MATERIALITY TRIGGER	+	0.0216 (0.2559)	0.0272 (0.1532)	0.0047 (0.7979)	0.0104 (0.5710)
ROA	+	0.0713 (0.6916)	0.0242 (0.8901)	-0.0375 (0.7639)	-0.0812 (0.5000)
LEV	+	0.0463 (0.3108)	-0.0008 (0.9871)	-0.0069 (0.8556)	-0.0402 (0.3164)

Table 7. Multivariate results for our main model (Part 2)

	<i>Predicted association</i>	<i>CQSCORE</i>	<i>CQSCORE</i>	<i>DQSCORE</i>	<i>DQSCORE</i>
MULTINATIONAL	+	0.0010*** (0.0000)	0.0010*** (0.0000)	0.0008*** (0.0000)	0.0008*** (0.0000)
BOARD SKILLS	+	0.0004 (0.1788)	0.0003 (0.3310)	0.0005** (0.0279)	0.0005** (0.0320)
BOARD EXP	+	0.0022 (0.4417)	0.0058* (0.0533)	-0.0008 (0.6969)	0.0016 (0.4660)
NOSHFF	+	0.0011*** (0.0005)	0.0008** (0.0151)	0.0007** (0.0123)	0.0004 (0.1315)
AUDIT ENVIRONMENT	+	0.0005 (0.7829)	0.0035 (0.7190)	0.0010 (0.4891)	0.0000 (0.9994)
BIG4	+	0.0329 (0.2343)	0.0058 (0.8484)	0.0279 (0.2800)	0.0047 (0.8634)
NYSE	+	-0.0075 (0.6525)	-0.0338* (0.0532)	0.0084 (0.6493)	-0.0118 (0.5115)
Constant		0.0786 (0.3773)	-0.4096 (0.3338)	0.0491 (0.5253)	0.0026 (0.9931)
Year controls		Yes	Yes	Yes	Yes
Country controls		No	Yes	No	Yes
Adj. R-squared		0.1894	0.2461	0.183	0.2221
F		8.95	8.12	8.66	8.04
Prob. > F		0.0000	0.0000	0.0000	0.0000
Number of observations		654	654	654	654

Note: The regressions are estimated by running the linear regression

$$DSCORE_{it} = \alpha + \beta_1 PREPARATION COST_{it} + \beta_2 PROPRIETARY COST I_{it} + \beta_3 PROPRIETARY COST II_{it} + \beta_4 GROWTH OPP_{it} + \beta_5 ENFORCEMENT_{it} + \beta_6 MATERIALITY GW_{it} + \beta_7 MATERIALITY IMP_{it} + \beta_8 MATERIALITY TRIGGER_{it} + \beta_9 ROA_{it} + \beta_{10} LEV_{it} + \beta_{11} MULTINATIONAL_{it} + \beta_{12} BOARD SKILLS_{it} + \beta_{13} BOARD EXP_{it} + \beta_{14} NOSHFF_{it} + \beta_{15} AUDIT ENVIRONMENT_{it} + \beta_{16} BIG4_{it} + \beta_{17} NYSE_{it} + \text{Year Controls} + \varepsilon_{it}$$

and using robust standard errors. The dependent variable (DSCORE) represents either the firm year-specific disclosure compliance quality score (CQSCORE) or the disclosure quality score (DQSCORE). All variables are defined in the Appendix. P-values are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Columns 1 to 4 of Table 8 show the regression results for two subsamples. We use the variable ENFORCEMENT and conduct a median split to distinguish between countries with a weak and a strong enforcement environment. As Germany represents the median, we decided not to split German firms into two groups but to assign firm years from Germany consistently to the group “strong enforcement environment”. This leads us to 299 firm year observation in a weak and 355 firm year observation in a strong enforcement environment.

The results are in line with our hypotheses. As expected in *Hypothesis 1b*, the negative association between PREPARATION COST and compliance quality is, economically, more pronounced within a weak enforcement environment. The same holds, statistically and economically, for the association between PROPRIETARY COST I and PROPRIETARY COST II and the compliance quality score (*Hypothesis 2c*); and the disclosure quality score as well. The results support the notion that within a stronger enforcement environment the cost of non-compliance is higher and accordingly affects the firms’ trade-offs between the cost and benefits of disclosure. For GROWTH OPP, the results are also in line with our expectations (*Hypothesis 3b*). Within a stronger enforcement environment, we find an economically weaker association between GROWTH OPP and disclosure quality. Remarkably, we also find a, statistically and economically, weaker association between GROWTH OPP and compliance quality. The former finding is in line with the notion, that a stronger enforcement environment curtails discretionary disclosure. Likely, due to potentially higher enforcement and litigation cost.

5.5. Sensitivity analysis and robustness checks

Our descriptive results suggest that firms with and without goodwill impairments differ in a variety of characteristics. Moreover, Tsalavoutas et al. (2014) examining IFRS 3, IAS 36 and IAS 38 related disclosures in a worldwide setting suggest that there is a difference in disclosure compliance levels between firms reporting impairment losses and those not reporting impairment losses. Therefore, we rerun our main model separately for goodwill-impairers and non-goodwill-impairers. We find that the results as depicted in Columns 5 to 8 of Table 8 differ from those in Table 7 with respect to some variables. The significant negative associations between PREPARATION COST and our two scores are robust. For proprietary costs, we still find a negative association between our two proxies and scores in all but one regression. It is noteworthy that we observe changes in the level of statistical significance. For goodwill impairers, we find our industry-specific measure PROPRIETARY COST I significantly negatively associated with the compliance and quality scores at the 1% level. The negative association with our firm-specific measure PROPRIETARY COST II is insignificant. For non-goodwill-impairers, the negative association between the firm-specific measure PROPRIETARY COST II and the compliance and the quality scores are significant at the 10% and 5% level while the associations with the industry-specific PROPRIETARY COST I and the two scores are insignificant. We argue that the negative association between proprietary cost and our two scores is robust also when examining firm years with and without goodwill impairments separately. However, the changes in the levels of statistical significance might be interpreted in the way that industry-specific proprietary cost is of higher importance for goodwill impairers while firm-

specific proprietary cost plays a more important role for non-goodwill-impairers. Considering GROWTH OPP, we find that the significant positive association with our scores found in our main analysis holds for non-goodwill-impairers only. This is not surprising since non-goodwill-impairers can be reasonably expected to show higher growth opportunities (and actually do according to our sample, see Table 4), which they are likely to be willing to signal to the market. Regarding ENFORCEMENT, the positive association with our scores found in our main

analysis is robust for goodwill impairers at slightly weaker statistical significance levels than for the full sample. In line with *Hypothesis 4b*, also the results are more pronounced for the association with the compliance score. For non-goodwill-impairers, we observe a positive and significant association with the compliance score and an insignificant positive association with the quality score. Also for non-goodwill-impairers, the results are more pronounced for the association with the compliance score.

Table 8. Separate regression results for firms within a weak and strong enforcement environment and for goodwill impairers and non-goodwill-impairers

	Weak enforcement environment		Strong enforcement environment		Goodwill-impairers		Non-goodwill-impairers	
	CQSCORE	DQSCORE	CQSCORE	DQSCORE	CQSCORE	DQSCORE	CQSCORE	DQSCORE
	1	2	3	4	5	6	7	8
PREPARATION COST	-0.0518***	-0.0334***	-0.0346***	-0.0331***	-0.0195**	-0.0211***	-0.0283***	-0.0221***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0239)	(0.0037)	(0.0000)	(0.0000)
PROPRIETARY COST I	-0.1813***	-0.1372**	-0.0208	-0.0612	-0.2091***	-0.1790***	0.0052	-0.0336
	(0.0085)	(0.0145)	(0.7343)	(0.1781)	(0.0071)	(0.0094)	(0.9277)	(0.4315)
PROPRIETARY COST II	-0.1436***	-0.0848**	-0.0201	-0.0470*	-0.0571	-0.0584	-0.0726*	-0.0589**
	(0.0081)	(0.0399)	(0.6086)	(0.0986)	(0.3350)	(0.2411)	(0.0584)	(0.0323)
GROWTH OPP	0.0137***	0.0095**	0.0068*	0.0058**	0.0000	-0.0024	0.0046*	0.0056***
	(0.0085)	(0.0286)	(0.0567)	(0.0204)	(0.9968)	(0.7337)	(0.0876)	(0.0071)
ENFORCEMENT					0.0093**	0.0068**	0.0042**	0.0022
					(0.0210)	(0.0468)	(0.0237)	(0.1182)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	No	No	No	No
Adj. R-squared	0.2752	0.2371	0.2386	0.2205	0.3419	0.3863	0.1647	0.1323
F	4.90	5.56	6.96	6.13	5.93	5.96	7.48	5.50
Prob. > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Number of observations	299	299	355	355	126	126	528	528

Note: For columns 1 to 4, the regressions are estimated by running the linear regression depicted in Equation 2 and under Table 7 separately for firm years within a strong and weak enforcement environment while excluding the control for ENFORCEMENT. We conduct a media split using the variable ENFORCEMENT to distinguish between a weak and strong enforcement environment. As Germany represents the median, we allocated all firm-year observations from German firms to strong enforcement environment. For columns 5 to 8, the regressions are estimated by running the linear regression depicted in Equation 2 and under Table 7 separately for firm years with and without goodwill impairments. For all regressions, we used robust standard errors and included an intercept, which is not tabulated. P-values are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All variables are defined in the Appendix.

One could argue that the threshold we defined to identify insignificant goodwill (1% of lagged total assets or less in the main analysis) is rather low. However, if we change this threshold to 10% of the lagged total assets, we lose one-third of our observations while the results concerning our main model remain qualitatively similar. However, the association between the scores and the proprietary cost is statistically significant only for PROPRIETARY COST II and the disclosure score.

Additionally, in our main analysis, we assume that any reported impairment loss is material unless it is explicitly stated within the notes that the goodwill impairment loss is immaterial or if less than 1% of the goodwill recognized at the beginning of the period is impaired. If we change this threshold to 10%, the results also do not change significantly.

To further check the robustness of our results and to provide evidence that differences between compliance and disclosure quality are not (exclusively) driven by the four additional voluntary disclosure items within our disclosure quality score (Q1-Q4), we rerun our regression excluding these four items from the disclosure quality score calculation. The results do not differ significantly from our main analysis.

Moreover, our proxy for preparation cost, the inverse of the natural logarithm of total assets, could be challenged as being a noisy measure. Therefore, as a robustness check, we decided to use an arguably more calibrated measure and rely on the inverse natural logarithm of audit fees as a proxy for preparation cost. When doing so, we lose 45 firm year observation in our regression sample but obtain similar results in our main model. The inverse of the natural logarithm of audit fees is negatively and significantly associated with both scores but the coefficient is of lower magnitude than when using the inverse of the natural logarithm of total assets as a proxy for preparation cost. Moreover, the still throughout negative association between proprietary cost and our scores is statistically significant for PROPRIETARY COST I and the disclosure score only. The association between GROWTH OPP and our scores remains positive but becomes insignificant. The results for ENFORCEMENT remain similar to our main analysis while the association with disclosure quality becomes significant at the 10% level (in comparison to the 5% level in our main analysis).

Finally and although we do not observe any concerns for multicollinearity, one could argue that the high correlation between ROA and our proxies for proprietary cost might affect our result. Additionally, higher profitability could also be

interpreted as a basic measure for a higher proprietary cost. However, when running our analysis without controlling for ROA, the results do not change significantly.

6. SUMMARY AND CONCLUSION

In its post-financial and economic crisis review of goodwill accounting, the ESMA criticizes the low disclosure quality among European listed companies and, among others, attributes this finding to cross-country differences in enforcement. However, little research has been conducted on the firm-specific determinants of the goodwill impairment test related disclosure compliance and on disclosure quality in particular. Prior research regarding goodwill impairment test related disclosures regularly addresses only compliance quality.

In our study, we analyzed the goodwill impairment test related disclosures of 864 consolidated financial statements of the STOXX Europe 600 in 2011 and 2012. Beyond pure disclosure compliance (using a dichotomous score), our study additionally addresses disclosure quality in terms of the extent of additional voluntary disclosure. Therefore, we differentiate within our disclosure quality measure whether the provided information is entity-specific rather than of boilerplate nature.

Our descriptive results confirm prior findings that the overall compliance rate is rather low (e.g., Glaum et al., 2013; Devalle & Rizatto, 2012). Only 31.59% of the reports comply with all disclosures required by IAS 36. The item-specific disclosure compliance and disclosure quality analysis reveals that the low level of compliance is not limited to a specific disclosure requirement. With respect to disclosure quality, we show that in particular, disclosure requirements regarding explanations of the management's approach to determining specific variables (e.g., growth rates or discount rates) are regularly of a boilerplate nature. Consequently, it seems reasonable that the ESMA emphasizes the need to improve the quality of financial statement disclosures and explicitly addresses goodwill impairment test related disclosures within their enforcement priorities (ESMA, 2014; ESMA, 2017).

Our multivariate results contribute to the literature as they provide further insights into the determinants of goodwill impairment test related disclosures and reveal that firms act strategically when deciding whether to comply with IAS 36 disclosure requirements and whether or not to provide additional voluntary disclosure in terms of high disclosure quality. Table 9 summarizes our hypotheses and the corresponding results.

Table 9. Summary of results

<i>Hypothesis number</i>	<i>Hypothesis</i>	<i>Result</i>
1a	Goodwill impairment test related disclosure compliance and disclosure quality are negatively associated with preparation cost.	Supported
1b	The negative association between preparation cost and compliance quality is more pronounced within a weak enforcement environment.	Supported
2a	Goodwill impairment test related disclosure compliance and disclosure quality are negatively associated with a firm's proprietary costs.	Supported with limitations
2b	The negative association between proprietary cost and disclosure quality is more pronounced than the negative association between proprietary cost and compliance quality.	Supported
2c	The negative association between proprietary cost and compliance quality is more pronounced within a weak enforcement environment.	Supported
3a	Goodwill impairment test related disclosure compliance and disclosure quality are positively associated with growth opportunities.	Supported
3b	The positive association between growth opportunities and disclosure quality is more pronounced within a weak enforcement environment.	Supported
4a	Goodwill impairment test related disclosure compliance and disclosure quality are positively associated with a country's enforcement quality.	Supported with limitations
4b	The positive association between enforcement quality and compliance quality is more pronounced than the positive association between enforcement quality and disclosure quality.	Supported with limitations

In accordance with economic theory and prior research (Paugam et al., 2015; Mazzi et al., 2017), we find direct and indirect (proprietary) cost of disclosure negatively associated with compliance quality and disclosure quality; while growth opportunities and the quality of the enforcement environment show a positive association with disclosure. With regard to the indirect cost of disclosure, we show that the negative association between proprietary cost and disclosure quality is more pronounced than the negative association between proprietary cost and compliance quality. Accordingly, when proprietary cost is high, firms make use of boilerplate disclosure and avoid additional voluntary disclosure.

Furthermore, we contribute to the literature and reaffirm prior findings as a subsample analysis reveals that the enforcement environment affects

firms' strategic behavior (Glaum et al., 2013; Glaum et al., 2018). In a weak enforcement environment, i.e. when the cost of non-compliance can reasonably be expected to be low, the negative association between direct and indirect cost and disclosure is more pronounced than within a strong enforcement environment. Accordingly, in the presence of high proprietary cost and a weak enforcement environment, firms decide to offer low disclosure quality and even avoid boilerplate disclosures. Firms seem to expect that benefits out of a possible reduction in the cost of capital by mitigating information asymmetries (Paugam & Ramond, 2015; Mazzi et al., 2017) are lower than the direct and indirect cost of disclosure. Nevertheless, when disclosure incentives in terms of high growth opportunities are present, firms offer both, better compliance and disclosure quality. However, a

strong enforcement environment curtails this discretionary disclosure. Within a strong enforcement environment, the association between the cost of disclosure and disclosure behaviour is less pronounced. The association between proprietary cost and disclosure compliance is insignificant and the negative association between proprietary cost and disclosure quality is economically and/or statistically weaker than in a weak enforcement environment. Moreover, a strong enforcement environment seems also to curtail discretionary disclosure when disclosure incentives (high growth opportunities) are present. Arguably, due to the higher potential enforcement and litigation cost (Brown et al., 2014), the positive association between growth opportunities and disclosure compliance quality is less pronounced than within a weak enforcement environment.

Overall, our results help to increase the understanding of the observed low levels of goodwill impairment test related disclosure quality in the EU and related prior research findings. We show that despite applying harmonized accounting standards, differences in disclosure compliance and quality among countries remain and can be attributed to firms that conduct a trade-off between preparation and proprietary cost of disclosure, disclosure incentives and the enforcement and litigation cost of non-disclosure. Our findings assist regulators and enforcers in identifying firms with incentives for non-disclosure. Namely, we point to preparation and proprietary cost as a driver of poor compliance quality. This might be helpful information for standard setters as it indicates that firms consider the benefits from the mandatory disclosures to be lower than the cost of disclosure at a firm level. Accordingly, policy makers and standard setters

have to consider whether the social benefits of the mandatory disclosure exceed the cost of the disclosure when reassessing the current disclosure requirements (see Leuz & Wysocki, 2016). For investors, it is noteworthy, that firms' with high growth opportunities provide better disclosure quality and compliance, which might help investors to formulate their own expectations about future earnings and cash flows. Moreover, we contribute to the literature by emphasizing the importance of the enforcement environment when examining the association between disclosure and its determinants and, hence, offer implications for the development of enforcement mechanisms in Europe.

Our study faces typical limitations of empirical-archival accounting research, for instance, a relatively small sample size, arguable measures for proprietary cost and self-constructed scores that—despite employing measures to ensure validity and reliability—could be criticized for involving subjective judgment in their construction and evaluation. This might make it more challenging to replicate and generalize our findings. Moreover, firms might not have included certain disclosures for materiality issues. Depending on whether or not this has been done in compliance with IFRS, our results might be distorted. However, our study also points to promising pathways for future research. As our item specific analysis reveals variation in the item specific compliance and disclosure quality, it might be interesting to examine the determinants of compliance and disclosure quality on a more disaggregated level. This might offer standard setters an indication, which disclosures firms consider particularly costly with regard to preparation and proprietary cost.

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Appendix

Variable Definitions

Continuous variables	
α	Intercept
β	Regression coefficient
AUDIT ENVIRONMENT	Weighted country specific score consisting of nine different items (e.g. auditors must be licensed; quality assurance program is in place) (Brown et al., 2014). We applied the latest available score (for 2008) as our audit environment proxy.
BOARD EXP	Average number of years each board member has been on the board.
BOARD SKILLS	Percentage of board members who have either an industry specific background or a strong financial background.
ENFORCEMENT	Weighted country specific score consisting of six different items (e.g. the body reviews financial statements, the body provides a report about its review of financial statements) (Brown et al., 2014). We applied the latest available score (for 2008) as our enforcement activity proxy.
GROWTH OPP	Market-to-book-value
MATERIALITY GW	Goodwill intensity: Defined as goodwill divided by total assets
MATERIALITY IMP	Goodwill impairment losses magnitude: Defined as goodwill impairment loss divided by goodwill prior to the impairment
LEV	Total liabilities divided by total assets
MULTINATIONAL	Share of foreign revenues
PROPRIETARY COST II	Within industry ranking of the firm's profit margin. MARGIN is scaled to range from zero to one.
NOSHFF	Ratio of shares in free float to total number of shares
ROA	Return on Assets: Defined as Net Income divided by lagged total assets
PROPRIETARY COST I	Industry specific proxy for competition: persistence of abnormal operating profits away from the industry (Harris, 1998)
PREPARATION COST	Inverse of natural logarithm of total assets
Dichotomous variables	
BIG4	Indicator variable that takes the value of 1 if the auditor is one of the BIG4 audit firms (KPMG, Ernst & Young, Deloitte, or PWC), and 0 otherwise
MATERIALITY TRIGGER	Indicator variable that takes the value of 1 if a firm did not recognize a goodwill impairment loss although its MTBV is below 1 and zero otherwise
NYSE	Indicator variable that takes the value of 1 if the firm is listed at the New York Stock Exchange and zero otherwise
Compliance score and disclosure quality score calculation	
DSCORE	Unweighted Compliance Score (CQSCORE) or unweighted Disclosure Quality Score (DQSCORE)
$a_{j,i,t}$	Dummy variable that takes the value of 1 if item j is applicable for firm i in period t; zero otherwise
$d_{j,i,t}$	Compliance Quality Score (CQSCORE): Dummy variable that takes the value of 1 if item j is disclosed by firm i in period t; zero otherwise (no information disclosed by firm i in period t) Disclosure Quality Score (DQSCORE): Dummy variable that takes the value of 0.5 if boilerplate information with respect to item j is disclosed by firm i in period t; 1 if firm-specific information with respect to item j is disclosed voluntarily by firm i in period t (see Table 1 for detailed description of boilerplate and firm-specific information); zero otherwise (no information disclosed by firm i in period t)
m	Number of maximum items of DSCORE; equals 15 for Compliance Score and 19 for Quality Score
Indices	
i	Index for firm
j	Index for component of DSCORE
t	Index for year