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## Tax loss carryforward disclosure and uncertainty

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Vanessa Flagmeier / Jens Müller

## **Tax Loss Carryforward Disclosure and Uncertainty**

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# Tax Loss Carryforward Disclosure and Uncertainty

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# Tax Loss Carryforward Disclosure and Uncertainty

## Abstract

We examine whether companies voluntarily disclose additional information about tax loss carryforwards when the recoverability is more uncertain. With this study, we aim to explain part of the huge cross-sectional variation in the tax footnote. To assess disclosure behavior, we hand collect data from notes of large German firms' IFRS financial statements and identify voluntarily disclosed information beyond the requirements of IAS 12. We find that uncertainty about the usability of tax losses has a significantly negative relation to the amount and quality of disclosure, controlling for other disclosure determinants derived from prior literature. These findings are robust for several indicators representing information and income uncertainty. Our findings suggest that managers anticipate the investors' need for more private information and disclose them voluntarily to send a signal of credibility to the market participants. It can be assumed that disclosing this information is less costly than facing potential risk premiums demanded by investors leading to higher cost of capital. This result indicates that part of the cross-sectional variation in the tax footnote can be explained by differing expectations to use the tax losses.

**Keywords:** Tax loss carryforwards, disclosure, uncertainty, capital cost, deferred taxes

# 1 Introduction

We examine the voluntary disclosure of an important component of the tax footnote: tax loss carryforwards. The literature indicates that the tax footnote is complex to produce, hard to understand, and cannot easily be compared between different firms. Hanlon and Heitzman (2010, p. 132, FN 16) argue that the disclosure “in the tax note is to some extent a choice variable”. Ready et al. (2011) analyze the tax footnote in detail with respect to book-tax difference items. They find a stable reporting policy within companies but wide variation across firms. Ready et al. ask for future research to examine why some companies provide extensive details in the tax footnote and others report only fundamental information or aggregate all items. Moreover, the European Financial Reporting Advisory Group and the UK’s Financial Reporting Council (EFRAG/FRC, 2011) have issued a discussion paper on potential improvements of the International Accounting Standard (IAS) 12 in which they propose a standardization of certain parts of the tax footnote. The majority of the respondents to the discussion paper support a more uniform layout and about half of the respondents are in favor of “more detailed and improved disclosures regarding deferred tax assets, especially unused tax losses and unused tax credits.” (EFRAG/FRC, 2013, p. 12/13).

In this study, we address the lack of comparability of tax information in the financial statements by helping to explain part of the cross-sectional variation. We focus on tax loss carryforwards as an important part of the tax footnote for the following reasons. The feedback to the EFRAG/FRC (2011) discussion paper indicates that particularly the information about tax loss carryforwards is hard to understand. At the same time, an OECD (2011) study indicates that the amount of losses carried forward is constantly rising. Even in 2006, before the financial crisis exacerbated the loss situation of firms, large OECD countries had a stock of losses carried forward (in percent of the GDP) of e.g. 13.6 for France, 15.2 for Sweden and up to 24.8 for Germany. These amounts can lead to significant tax savings for the respective firms. Given the economic relevance, unused tax losses are an important impact factor on firms’ future after-tax income and should therefore be of interest for capital-market participants.

We expect to find a systematic variation in the disclosed information about unused tax losses, depending on the future usability. The crucial point is whether and when the tax loss carryforwards are expected to reduce taxable income. If carryforwards are usable in the near future, the tax saving potential can be valued as an asset. Uncertainty about the usability, on the other hand, reduces the contribution to firm value. Even worse, the

evidence of carryforwards, which are not expected to be usable, can be interpreted as an indicator for further losses in the future (Amir and Sougiannis, 1999).

The assessment of the usability of tax loss carryforwards is usually easier for management than for capital market participants. Resulting information asymmetries can affect the liquidity of the firm's shares and hence the cost of capital (Leuz and Wysocki, 2016). To avoid additional costs, companies should be interested in reducing information asymmetries in the case of doubts about the usability of tax loss carryforwards. Therefore, we expect an increase in the disclosure of tax loss information if the usability of tax loss carryforwards becomes more uncertain.

At the same time, there are at least two reasons why firms might not disclose this information. First, the costs of gathering and editing the information. The fact that much of the information exists in the single entity tax statement does not mean that it can easily be summarized at the accounting group level. Researchers and practitioners agree that tax footnotes are costly and complex to produce (Ready et al., 2011; PwC, 2012). Second, extensive tax information reveals insights into company performance (Lenter et al., 2003). Kvaal and Nobes (2013, p. 251) state that "...complete tax disclosures provide the opportunity to estimate important amounts in the company's tax return. By comparing these amounts with financial reporting amounts, the analyst may obtain insights about the company's performance and strategies, for example, regarding earnings quality, adequacy of depreciation schedules, the degree of conservatism and tax planning activities." These insights can cause proprietary costs. Robinson and Schmidt (2013) examine proprietary costs resulting from disclosure of uncertain tax positions and find a negative association with disclosure quality, consistent with a reduction in disclosure quality for firms that face high proprietary costs. In sum, firms have incentives to disclose more tax loss carryforward information in the case of uncertain usability but also bear costs of disclosure.

In this study, we analyze whether firms expect a net benefit and increase disclosure for uncertain tax loss carryforwards. The main indicator to assess uncertainty about the recoverability is future earnings. Without taxable income in the future, loss carryforwards cannot be offset. Hence, if investors do not expect the company to generate sufficient earnings in future years, they do not assign a positive value to tax loss carryforwards. A number of factors can impact investors' expectations of the probability that carryforwards can be used in the near future. Basically, the usability of tax loss carryforwards depends on the tax law rules which must allow an offset with future positive net income and whether the company generates sufficient positive net income to offset

existing tax loss carryforwards. Investors usually are affected by insufficient information on both areas. Necessary tax specific information, e.g. for loss offsetting rules in international subsidiaries, is rarely disclosed in financial statements which induces uncertainty due to incomplete information. Furthermore, companies' future net income is uncertain by nature. However, the level of uncertainty may increase when it is doubtful that sufficiently positive net income will be realized in the future. We examine whether different sources of uncertainty are associated with the voluntary disclosure level. To mitigate concerns about reverse causality, we measure uncertainty before the annual report is published. We refer to the disclosure requirements of the international reporting standard IAS 12 "Income Taxes" to distinguish between mandatory and voluntary disclosures. Every tax loss carryforward item disclosed beyond these guidelines is counted as voluntary. Apart from the number of disclosed items, we evaluate reporting quality. We emphasize that we do not assess content quality of the reported information but the quality of presentation.<sup>1</sup> We use a disclosure scale to incorporate the level of detail and way of presentation, differentiating between qualitative and quantitative disclosures and the presentation in a table or in textual form.<sup>2</sup> Our sample consists of mainly hand collected data from annual reports' notes on income taxes of the German DAX-30 and M-DAX firms between 2005 and 2010. We estimate a pooled cross-sectional regression to investigate the influence of several variables representing uncertainty, on the level of disclosure.

We find that companies that are exhibited to greater ex ante uncertainty about the usability voluntarily disclose more and more salient information about tax loss carryforwards.<sup>3</sup> These findings are robust for several indicators representing information and income uncertainty. Our findings suggest that managers anticipate the investors' need for more private information and thus disclose them voluntarily to send a signal of credibility to the market participants. It can be assumed that disclosing this information is less costly than facing potential risk premiums demanded by investors.

Our results contribute to the literature about tax information in the financial statement. The literature indicates incomplete and not easily understandable disclosures about taxes that differ remarkably between companies. It is not clear why some firms provide extensive details while others report only (if anything) the mandatory items. In this study, we aim to explain part of the variation. We provide insight in the incentives to disclose tax loss

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<sup>1</sup> To assess the quality of the reported information, we would have to make subjective assumptions about the usefulness of every piece of information or, better, ask capital-market participants for the usefulness.

<sup>2</sup> The disclosure scale is based on criteria of the German yearly annual report contest 'Best Annual Report' (Baetge, 1997), for further details see chapter 4 *Disclosure Level*.

<sup>3</sup> 'Salient' refers to the quality of disclosure, based on the classification of the disclosure scale.

carryforward information, an important component of the tax footnote. Our results are consistent with firms adjusting their tax disclosure to the need for information caused by uncertainty. This finding indicates that the incentives to provide additional information are larger than the costs incurred by disclosing the data. Given that the IAS 12 disclosure requirements are perceived to be incomplete and to allow too much discretion, firms seem to voluntarily provide additional information when needed.

This finding indicates that part of the lacking comparability of the tax footnote is attributable to firms' customized disclosure. However, we acknowledge that we analyze the top 80 firms of the German capital market and that the findings might not hold for smaller and less liquid firms that could have other disclosure incentives.

A distinguishing feature of our research is furthermore the sample of IFRS statements – most of the international tax loss and deferred tax literature investigates US-GAAP or local GAAP data. As the number of IFRS adopting countries is steadily increasing, the disclosure under IAS 12 is of interest for a wide audience. We use a sample of German firms because the traditionally conservative accounting environment in Germany can foster the expected relationship. As the recognition of deferred taxes for loss carryforwards has only recently gained relevance under German local GAAP, firms may even under international standards continue to understate this item. Kvaal and Nobes (2012) document that reporting after IFRS adoption continues to be shaped by national patterns. Hence, investors' valuation of loss carryforwards needs to be based on additional information. The results of Chludek (2011) support this assumption, indicating basically no value relevance of deferred taxes for loss carryforwards for her German IFRS sample. Consequently, management needs other means to communicate the value of tax losses, like increased disclosure of information. Our study helps to answer the question whether firms actually increase voluntary disclosure in the case of higher uncertainty. Thus, we add to the disclosure literature, investigating the relation between investor uncertainty and managements' disclosure policy.

The remainder of this paper is structured as follows. Section 2 discusses related literature and underlying theory. In Section 3, we provide the development of the hypothesis. Section 4 describes the research design and Section 5 presents our results. Section 6 discusses several robustness tests. Concluding remarks are given in Section 7.

## **2 Literature Review and Underlying Theory**

Our study is related to two streams of research: the valuation of tax loss carryforwards and the disclosure of tax information.



The assumption that firms try to reduce their cost of capital via additional tax loss disclosure requires that tax loss carryforward information is relevant for capital market participants. While there are a number of studies about the pricing of deferred taxes on loss carryforwards, there is less evidence on the valuation of the underlying tax loss carryforwards.<sup>4</sup> Zeng (2003) examines the value relevance of tax loss carryforwards for Canadian data. He classifies loss carryforwards into different categories depending on the restrictions that inhibit or delay the offset against income. He finds a positive and significant association between market value and tax loss carryforwards. Moreover, he concludes that tax loss carryforwards with fewer restrictions enhance firm value more significantly. These results support our assumption of a reduced contribution to firm value in the case of a lower recover-probability.

The relation between recoverability and value implications is also supported by the deferred tax literature: Amir et al. (1997) examine the value relevance of deferred taxes under SFAS 109, separating the deferred tax components into seven categories. They hypothesize that the valuation of deferred taxes depends on the probability of reversal and find supporting evidence. Furthermore, their results indicate a negative but nonsignificant correlation between deferred taxes from losses (and credits) carried forward and stock prices. Amir et al. conclude that investors expect part of these carryforwards to be unusable. Chludek (2011) analyzes the value relevance and reversal of deferred taxes under IFRS/IAS. Her results indicate that generally investors do not consider deferred tax information to be value relevant. She attributes the lacking value relevance to missing cash-flow implications, finding that deferred tax assets for loss carryforwards translate more timely into cash-flow than other deferred tax components. Moreover, Chludek finds a significantly negative association between market value and deferred taxes for loss carryforwards for loss-making firms. As loss-makers can be expected to generate further losses in the future, these findings support our assumption about the relation between uncertain future earnings and a negative impact on firm value. Overall, the results of Amir et al. (1997), Zeng (2003) and Chludek (2011) indicate that the value of tax loss carryforwards increases with the likelihood of reversal.

Further evidence concerning deferred taxes for loss carryforwards is rather inconclusive. Amir and Sougiannis (1999) find a positive and significant association between deferred taxes for loss carryforwards and share prices.

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<sup>4</sup> For studies concerning deferred taxes without focusing on tax losses, see e.g. Chaney and Jeter (1994), Ayers (1998), Citron (2001), Bauman and Das (2004). Another related stream of literature investigates the valuation allowance for deferred taxes (for an overview, see Graham et al. (2010)).

At the same time, they also find evidence indicating that analysts estimate earnings of firms with loss carryforwards to be less persistent. The authors conclude that analysts do not fully capture the relation between tax loss carryforwards and future earnings. Chang et al. (2009) use Australian data to investigate the market perception of deferred taxes under the income method, finding a positive association between recognized deferred taxes form carryforward losses and returns. Hence, the market seems to support management's assessment of the tax loss carryforward valuation. While the above mentioned studies focus on the part of tax loss carryforwards that is expected to be usable, Herbohn et al. (2010) investigate those tax losses for which no deferred taxes are recognized. Their findings indicate that this amount is used for earnings management but at the same time to communicate management's private information about future profitability.

In sum, the literature indicates that tax loss carryforwards affect firm valuation but the findings do not clarify whether deferred taxes are a suitable way for management to signal tax loss usability.

The second stream of related literature concerns the disclosure of tax information. As tax returns are not publicly available, tax information has to be derived from accounting statements. However, due to incomplete or complex information, it is often difficult to establish the link between financial statements and tax information. Hanlon (2003) outlines the problems to calculate taxable income based on financial statements. Practitioners confirm this notion: "...tax information in the financial statements is one of the least understood areas of financial reporting, according to investors." (PwC, 2012, p. 34). Few studies so far examine the characteristics of tax information in detail. Kvaal and Nobes (2013) analyze the disclosure of two tax reconciliations in financial statements: tax expense to pre-tax profit and deferred tax expense to net deferred tax liabilities. The authors find systematic differences between companies from different countries and industry sectors. Related to our setting, Kvaal and Nobes (2013) find that German firms report incomplete deferred tax reconciliations and that the reconciliation of tax expense to pretax profit varies substantively among German companies. The authors conclude with a list of suggested improvements to IAS 12. Ready et al. (2011) analyze the tax footnote in detail with respect to book-tax difference items. They find a stable reporting policy within companies but wide variation across firms. Ready et al. ask for future research to examine why some companies provide extensive details in the tax footnote and others report only fundamental information or aggregate all items. Similarly, Evers et al. (2014) find large differences in the deferred tax reporting behavior of German firms.

In this study, we try to explain part of the variation. To our knowledge, we are the first to provide insight in the incentives to disclose tax loss carryforward information, an important component of the tax footnote. We investigate whether a firm voluntarily provides more tax loss carryforward information, when the usability of the tax losses is uncertain. Therefore, we help to explain differences in the composition and level of detail of the tax footnote.

### **Capital Market and Information**

We assume that firms can reduce information asymmetries with respect to the usability of tax losses and hence their cost of capital by increasing disclosure. Without the threat of additional cost of capital, management would not be willing to bear the cost and effort that comes along with increased disclosure. Thus, the relationship between information asymmetries and cost of capital is the main theoretical foundation of our analysis.

There is a rich literature on the relation between information asymmetries and cost of capital.<sup>5</sup> The presence of information asymmetries can result in an increasing bid-ask spread and reduce the liquidity of a firm's shares (Glosten and Milgrom, 1985). To spur potential investors to buy the shares despite reduced liquidity, firms have to issue capital at a discount. This increase in capital costs can be avoided by additional disclosure. Diamond and Verrecchia (1991) find that reduced information asymmetries result (in most cases) in a decrease in the firm's cost of capital. Empirical studies corroborate the negative relation between disclosure and cost of capital. Healy, Hutton, and Palepu (1999) document that increased voluntary disclosure is associated with increased stock returns and stock liquidity. Leuz and Verrecchia (2000) examine firms that have committed themselves to a higher disclosure level and find that those firms have smaller bid-ask spreads and higher trading volume than the control group. Botosan and Plumlee (2002) find a negative relation between the annual report disclosure level and the cost of equity capital. Further evidence on liquidity effects of disclosure as well as possible direct effects of disclosure on the cost of capital is summarized in Healy and Palepu (2001) and, more recently, in Leuz and Wysocki (2016).

Overall, theory and empirical findings indicate that a decrease in information asymmetries can reduce a firm's cost of capital. Hence, firms have an incentive to increase disclosure in the presence of information asymmetries.

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<sup>5</sup> For a review of the disclosure theory, see Verrecchia (2001) and Leuz and Wysocki (2016). For a review of the direct link between disclosure and cost of capital, see Botosan (2006).

### 3 Hypothesis Development

The effect of tax loss carryforwards on firm valuation is controversially discussed. Accounting standards as well as prior literature seem to be torn between the positive effect due to potential future tax savings and the possibly negative impact of losses. The distinction between the two effects depends crucially on the probability that the carryforwards can be used in the near future. If investors expect sufficient taxable income, the tax loss carryforwards represent tax saving potential and are value enhancing. Without offsetting options, the carryforwards are worthless and can be interpreted as a signal for further losses in future periods (Amir and Sougiannis, 1999). Investors can be assumed to be particularly interested in information about tax loss carryforwards when it is not obvious whether they can be used.

The source of such investor uncertainty is twofold – information uncertainty and income uncertainty. The usability of tax loss carryforwards depends on the tax law rules which must allow an offset with future positive net income and whether the company generates sufficient positive net income to offset existing tax loss carryforwards. Necessary tax specific information is rarely disclosed in financial statements, which induces uncertainty due to incomplete information. Furthermore, companies' future net income is uncertain by nature. However, the level of uncertainty may increase when it is doubtful that sufficient positive net income will be realized in the future. Given that management is better informed about the usability of tax loss carryforwards than investors are, information asymmetries arise. According to theory and empirical evidence, information asymmetries can result in increased cost of capital.<sup>6</sup> To avoid this increase, firms have to reduce information asymmetries.

In line with international accounting regulations, management can communicate private information via the recognition of deferred taxes for loss carryforwards. For the recognition of deferred taxes, IAS 12 and SFAS 109 require taxable profit in the future.<sup>7</sup> Hence, given that the standards are obeyed correctly, the amount of recognized deferred tax assets for loss carryforwards is a signal of management's earnings expectation. But prior research indicates that the recognition of deferred taxes for loss carryforwards is subject to a remarkable level of discretion and might be driven by short-term income effects of deferred tax recognition. For example Herbohn et al. (2010) find that, on the one hand, deferred taxes for loss carryforwards provide information about management's earnings expectations. On the other hand, the deferred taxes are used to manage earnings.

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<sup>6</sup> See Section 2 for a discussion of the literature.

<sup>7</sup> See IAS 12.34 and SFAS 109.21.

Moreover, Bauman and Das (2004) argue that companies recognize too few deferred taxes and hence understate their future expectations due to strict SFAS 109 requirements and fear of litigation. Nevertheless, their findings indicate that investors use deferred taxes to predict future earnings. While the above-mentioned literature investigates Australian and US data, Chludek (2011) provides evidence for German firms reporting under IFRS. She finds value relevance of deferred taxes for carryforwards only for loss-making firms. Considering the German environment of traditionally conservative accounting and the empirical evidence, the informative value of the recognized deferred taxes is questionable.<sup>8</sup>

Therefore, we assume that firms use an alternative way to reduce the information asymmetries: the disclosure of additional information. Particularly disclosure that goes beyond the requirements of accounting standards, for example reasons for changes in the amount of tax loss carryforwards or when and why the company expects to use the carryforwards can be of interest for capital market participants. Still, there are at least two reasons why firms might not disclose this information. First, the costs of gathering and editing the information. The fact that much of the information exists in the single entity tax statement does not mean that it can easily transferred to the accounting group level. Researcher and practitioner agree that tax footnotes are costly and complex to produce (Ready et al., 2011; PwC, 2012). Particularly, the recognition of deferred tax assets is a controversial issue – under IFRS as well as US-GAAP. According to Petree et al. (1995, p. 71) the recognition of deferred tax assets is probably “the most complex and subjective area of Financial Accounting Standards Board Statement no. 109”.

Second, extensive tax information reveals insights into company performance (Lenter et al., 2003). Kvaal and Nobes (2013, p. 251) state that “...complete tax disclosures provide the opportunity to estimate important amounts in the company’s tax return. By comparing these amounts with financial reporting amounts, the analyst may obtain insights about the company’s performance and strategies, for example, regarding earnings quality, adequacy of depreciation schedules, the degree of conservatism and tax planning activities.” These insights can cause proprietary costs. Robinson and Schmidt (2013) examine proprietary costs resulting from disclosure of uncertain tax positions and find a negative association with disclosure quality, consistent with a reduction in disclosure quality for firms that face high proprietary costs.<sup>9</sup>

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<sup>8</sup> A number of German studies report an increase over time in the importance of deferred taxes for loss carryforwards, but at the same time criticize the level of discretion in the recognition, see e.g. Küting and Zwirner (2003; 2007); Baetge and Lienau (2007).

<sup>9</sup> Robinson and Schmidt (2013) further find that investors value the withholding of information in the case of high proprietary costs positively. However, in their setting proprietary costs arise from potential tax authority actions due to

In sum, firms have incentives to disclose more tax loss carryforward information in the case of uncertainty but also bear costs of disclosure. In this study, we analyze whether firms expect a net benefit and increase disclosure for uncertain tax loss carryforwards.

*H1: The level of voluntary disclosure is positively associated with uncertainty about the recoverability of tax loss carryforwards.*

## **4 Research Design**

### **Sample**

To investigate the financial statement disclosure of tax loss carryforwards, we employ a sample of hand collected data from annual reports' notes on income taxes. Further firm-specific accounting information is obtained from Thomson Reuters' Worldscope database. Our sample comprises the financial statements of listed DAX-30 and M-DAX companies over fiscal years 2005 to 2010 that are prepared in accordance with IFRS.<sup>10</sup> German firms listed on an EU-regulated market are required to adopt IFRS in their consolidated statements for each fiscal year beginning on or after January 1, 2005.<sup>11</sup> The sample period includes the years of the financial and economic crisis which increases the likelihood of tax loss carryforwards and is thus a suitable setting for our study. Our initial sample consists of 80 companies with 480 firm-year observations. 37 non-IFRS observations are excluded.<sup>12</sup> Moreover, we lose 81 observations due to missing data, resulting in a final sample of 76 companies and 362 firm-year observations. Table 1 gives an overview of the sample selection procedure.

[Insert Table 1 here]

### **Disclosure Level**

For the investigation of the voluntary disclosure level, we first distinguish between mandatory and voluntary information. As we use IFRS-data, the relevant standard is IAS 12. We identify six mandatory disclosures

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new tax information while the tax information in our setting is assumed to be primarily valuable for investors and competitors.

<sup>10</sup> We consider the companies listed on April 30, 2010. We are currently working on an extension of the sample period for the years 2011-2014.

<sup>11</sup> An exception applies to those who already use internationally accepted standards like US-GAAP – they could postpone the adoption of IFRS until the financial year 2007 (European regulation 1606/2002). We exclude the respective US-GAAP statements from our sample.

<sup>12</sup> We exclude US-GAAP statements due to differences in the tax loss carryforward disclosure requirements between IAS 12 and the US-GAAP standard SFAS 109.

concerning tax loss carryforwards:

- the amount of deferred tax assets recognized in the balance sheet for unused tax losses (IAS 12.81 (g) (i))
- the amount of the benefit from a previously unrecognized tax loss of a prior period that is used to reduce deferred tax expense (IAS 12.80 (f))
- the amount of the benefit from a previously unrecognized tax loss of a prior period that is used to reduce current tax expense (IAS 12.80 (e))
- the amount of unused tax losses for which no deferred tax asset is recognized in the balance sheet (IAS 12.81 (e))
- the expiry date of unused tax losses for which no deferred tax asset is recognized in the balance sheet (IAS 12.81 (e))
- the amount and nature of evidence supporting the recognition of a deferred tax asset when the entity has suffered a loss in the current or preceding period (IAS 12.82 (b))

Moreover, one item cannot clearly be classified as voluntary or mandatory: the amount of deferred tax income or expense recognized in the income statement due to unused tax losses (IAS 12.81 (g) (ii)). The classification is not clear because of the additional remark that this disclosure is only necessary if it is not apparent from changes in the amounts recognized in the balance sheet. Thus, the entity can choose whether it states the amount separately or leaves it to the reader, to derive it from the balance sheet. Due to this discretion, we decided to classify this item as voluntary.<sup>13</sup> Moreover, every disclosure beyond the six required items is considered as voluntary.

A common measure of information disclosure in the literature is the disclosure index (e.g. Chow and Wong-Boren, 1987; Raffournier, 1995; Makhija and Patton, 2004). A disclosure index compares a list of items that is expected or preferable to be reported with the effectively disclosed figures and aggregates the results to a single score. Although previous research frequently applies this method, we decided not to use the index. Instead, we count the number of all voluntary disclosures. We choose this way for two reasons. First, we do not want to restrict the collected data to a predefined set of items. Second, we want to avoid the subjectivity which comes along with setting up a list of disclosures.

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<sup>13</sup> Repeating our analysis with this item considered as mandatory does not affect our main results.

Once the voluntary items are identified, we investigate the quality of the disclosed information. Previous studies use different methods to assess disclosure quality (e.g. Singhvi and Desai, 1971; Biddle et al., 2009; Callen et al., 2011). The majority of these approaches, like for example Dechow and Dichevs' (2002) accrual based method, apply to the annual report as a whole. As we want to assess only a particular part of disclosure, these measures are not applicable to our study. Hence, we evaluate quality based on the level of detail and form of disclosure. Hirshleifer and Teoh (2003) model the effect of firms' choices between different forms of presenting information on market prices. They find that, under the assumption of limited attention, aggregated information is mispriced by analysts. Further, Atwood and Reynolds (2008) document that the way in which tax information is disclosed is related to the pricing of the information. We use a disclosure scale based on criteria of a German yearly annual report contest, organized by the 'Manager Magazin'. In this contest, a research group from the University of Muenster investigates annual reports of firms listed on DAX, MDAX, SDAX, TecDAX and Stoxx 50 with respect to content, design, and language. Disclosed items are analyzed regarding the way in which the information is reported. A scale assigns different scores to the items, depending on the level of detail and form of disclosure. The type of disclosure ranges from qualitative with a score of 0.5 over comparative and interval to quantitative with a score of two. If additional details are reported, the score increases by 1.5 points. The same holds for graphical support like the disclosure in a table or chart. Hence, the total score for one disclosed item can range from 0.5 for a simple qualitative item to five for a quantitative item with additional information and graphical support.<sup>14</sup> Table 2 Panel A provides an overview of the scale and Panel B gives examples how the points are assigned.

[Insert Table 2 here]

We apply the scale to every voluntary tax loss carryforward item. In the next step, we sum up the scores of the same year and company to get one score for each firm-year observation. The resulting score is our dependent variable *DISCL*.

### **Uncertainty**

We test our hypothesis by regressing *DISCL* on uncertainty about the recoverability of tax losses. To measure uncertainty, we identify factors that can cause doubts about the usability of tax loss carryforwards. We focus on

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<sup>14</sup>Assigned points: 2 (quantitative) + 1.5 (additional information) + 1.5 (graph or table).



the expectation that future positive net income can be offset against tax loss carryforwards, taking the perspective of an investor. Thus, we use proxies for the likelihood that a company generates future profits. There is not one single event or characteristic that can cause uncertainty but rather a number of possible influences. Hence, our proxies include direct future estimates as well as historic indicators.

Our first variable is most straight forward. We use analysts' earnings forecasts (*AEF*) to reflect the expectation of future taxable income. This variable represents mean EBIT forecasts for the following fiscal year and is extracted from I/B/E/S database. Since higher expected earnings increase the probability that tax loss carryforwards can be used and hence reduce uncertainty, less disclosure is needed. Therefore, we expect a negative relation between *AEF* and the level of disclosure. Another important factor to assess uncertainty is the dispersion of forecasts. A large variation in forecasted earnings indicates disagreement among analysts and complicates the evaluation of tax loss carryforward recoverability from the investors' perspective. Although the amount of forecasted earnings and the forecast dispersion may be correlated,<sup>15</sup> they basically represent different aspects of uncertainty. We use the standard deviation of earnings per share forecasts (*STDEV*) for the following fiscal year to measure dispersion and expect a positive association.

Among the historic indicators we refer to accounting standards' definitions for loss histories. According to IAS 12.35 and SFAS 109.100, the evidence of a loss history can create uncertainty due to the expectation of further losses in the future. As IAS 12 does not define a loss history, we use the definition of SFAS 109.100: a firm has a loss history if the cumulative pretax earnings of the current and two previous years are negative. Hence, we employ a dichotomous variable  $d\_LH$  which takes the value one if the company reports a cumulative pretax loss in the current and two previous years and zero otherwise, expecting a positive relation. To assess robustness of this measure, we further use two alternative loss history dummy variables. The first one ( $d\_LH1$ ) takes the value one if the company reports at least one negative EBT in the current or one of the two previous years and zero otherwise. Unlike  $d\_LH$ , this variable considers even the tiniest loss and can therefore indicate whether the expected effect is mainly driven by the amount of the loss or also by the mere existence. The other alternative variable follows the same idea but extends the relevant time period:  $d\_LH2$  takes the value one if the company reports at least one negative EBT in the current or one of the four previous years. For all three loss history

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<sup>15</sup> Table 7 shows a significantly negative correlation of *AEF* and *STDEV*. However, the correlation coefficient of -0.324 does not indicate a problem of serious multicollinearity.

proxies, we expect a positive association with *DISCL*.<sup>16</sup>

A potential concern in our research design is reverse causality. While this does not apply to the historic variables, we have to be cautious with respect to our future estimates. Therefore, we measure uncertainty before the information is disclosed, i.e. for *AEF* and *STDEV* we use December 31<sup>st</sup> values.<sup>17</sup>

### Model

To analyze the association between disclosure and uncertainty, we estimate the following basic model:

$$DISCL_{it} = \beta_0 + \beta_1 AEF_{it} + \beta_2 STDEV_{it} + \beta_3 d\_LH_{it} + \sum \beta control_{it} + \varepsilon_{it} \quad (I)$$

Detailed variable definitions can be found in Table 3. Firms are identified by *i*, years by *t*.  $\varepsilon$  is the error term.

[Insert Table 3 here]

*DISCL* denotes the disclosure level, like explained above. As we assume that our proxies *AEF*, *STDEV* and *d\_LH* capture different aspects of uncertainty, we include them jointly in our basic model. Additionally, we estimate separate models for the different loss history variables, in which *d\_LH1* (Model II) and *d\_LH2* (Model III) replace *d\_LH*, respectively.

$$DISCL_{it} = \beta_0 + \beta_1 AEF_{it} + \beta_2 STDEV_{it} + \beta_4 d\_LH1_{it} + \sum \beta control_{it} + \varepsilon_{it} \quad (II)$$

$$DISCL_{it} = \beta_0 + \beta_1 AEF_{it} + \beta_2 STDEV_{it} + \beta_5 d\_LH2_{it} + \sum \beta control_{it} + \varepsilon_{it} \quad (III)$$

Our control variables are derived from the disclosure literature and the specific characteristics of tax loss carryforwards. The first one is  $\Delta DTA\_TLC$ , denoting the change in deferred tax assets for tax loss carryforwards. This item can indicate management's earnings expectation because international accounting standards allow the recognition of deferred tax assets only if sufficient future taxable income is probably available. Hence, a positive change can imply management optimism about the usability of tax losses and reduce uncertainty. Therefore, management does not have to report additional information to reduce uncertainty and  $\Delta DTA\_TLC$  would be negatively related to the level of voluntary disclosure. However, previous research is inconclusive whether

<sup>16</sup> Alternatively, we construct the loss history variables with EBIT instead of EBT. Results for *d\_LH1* and *d\_LH2* are qualitatively unchanged. The coefficient of *d\_LH* is no longer significant. However, we assume that the latter finding is attributable to missing variation because only eight observations have a negative cumulative EBIT.

<sup>17</sup> Of our final sample 88% of all observations have a fiscal year end on December 31<sup>st</sup>. Excluding the firms with other fiscal year end does not alter our results, see our robustness analysis.

management actually uses deferred taxes to communicate private information.<sup>18</sup> The amount of deferred tax assets can be affected by earnings management (Herbohn et al., 2011) or fear of litigation (Bauman and Das, 2004). Moreover, management's considerable level of discretion regarding the recognition and subsequent adjustment of deferred taxes can lead to possible endogeneity problems. Hence, we are careful with ex ante expectations about the association. We calculate  $\Delta DTA\_TLC$  as the percent change in deferred tax assets for tax loss carryforwards from the previous to the current year.

Previous research indicates a significant association between the level of disclosure and size of the company (*SIZE*) (Cooke, 1989; Craig and Diga, 1998), leverage (*LEV*) (Meek et al., 1995; Ismail and Chandler, 2005), profitability (*ROA*) (Singhvi and Desai, 1971; Broberg et al., 2010), audit firm (*d\_AUD*) (Singhvi and Desai, 1971), and CEO-turnover (*CEO\_TO*) (Kwak et al., 2011). Moreover, we control for experience with the accounting regulations, measuring years that have passed since the company adopted IFRS/IAS (*IFRS\_AD*).<sup>19</sup> To address the concern that the variation in tax loss disclosure might be attributable to differences in the overall firm disclosure behavior, we include a proxy for the annual report disclosure level (*AR\_DISCL*). Again, we refer to the yearly annual report contest of the 'Manager Magazin'.<sup>20</sup> We are primarily interested in the scores for the quality of information content.<sup>21</sup> The results, provided by the Baetge-research group, range from zero to one (one indicates the highest quality of content).

Another possible influence on disclosure can be the first emergence of tax losses. If a firm did not have loss carryforwards before, no information could be reported. We do not further investigate this case because it applies only to one observation of our sample. To control for other unobserved effects, we include year and industry dummies (single-digit Standard Industrial Classification (SIC) code).

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<sup>18</sup> See section 2 for an overview of the deferred tax literature.

<sup>19</sup> Our starting point for this variable is 1995, i.e. if a company adopted IFRS (or rather IAS) before 1995, this variable understates the experience with the standards. However, given that many standards changed over time, we do not expect experience in the early adoption years to bias this variable.

<sup>20</sup> The score is used in the prior literature, e.g. in Daske, H. (2005) and Glaum et al. (2013).

<sup>21</sup> Apart from the content, the annual report contest also evaluates design and language.

## 5 Results

### Descriptive Results

To assess the level of disclosure, we first investigate which type of tax loss carryforward information is disclosed in annual reports' notes. We identify 15 different groups of voluntary items. Table 4 gives an overview of the type and frequency of these disclosures.

[Insert Table 4 here]

The most frequent disclosure is the effect of tax loss carryforwards on tax reconciliation which can be found in 50% of all annual reports. Moreover, 44% of the observations disclose the total amount of tax loss carryforwards. Five other voluntary disclosures are reported in more than one quarter of the statements (expiry date of total tax loss carryforwards; deferred tax income/expense recognized in the current year's income statement due to unused tax losses; valuation allowance for deferred tax assets on loss carryforwards; distinction between corporate tax loss and trade tax loss; amount of deferred tax assets for tax losses which have not been recognized).

In an attempt to systemize the different items, we divide the voluntary disclosures into four sub-categories. The first one contains basic information about tax loss carryforwards, i.e. amount and expiry date. The second category comprises items that explain why or to which amount tax loss carryforwards (or the recognized deferred taxes) have changed, have been used or have affected current fiscal year's income. The third group gives information about valuation allowances and deferred taxes that have not been recognized. Any other kind of disclosure is included in the fourth category.

To get an idea of the development of our dependent variable, Figure 1 shows the average yearly disclosure score over our observation period. Similarly, Figure 2 gives an overview of the development of the number of disclosed items, before the application of the disclosure scale. Except for a decline in 2009, the basic trend in both figures is slightly increasing disclosure over time.

[Insert Figure 1 and Figure 2 here]

Table 5 presents the basic descriptive statistics. The average voluntary disclosure score per year and firm (*DISCL*) amounts to 8.48 with a median of 6.50 and ranges from 0 to 42. The average earnings forecasts divided

by total assets (*AEF*) and the average current profitability (*ROA*) have a value of 9%, both with a standard deviation of also 9%. At least one loss in the current and two previous years (*d\_LHI*)<sup>22</sup> is reported by 23% of our observations but only in 7% of all observations, the loss dominates the three-year period (*d\_LH*). On average, deferred tax assets for loss carryforwards (*DTA\_TLC*) account for 1% of total assets, with a maximum of 31%. The change in the deferred taxes for loss carryforwards is on average 73% with a median of -2%.<sup>23</sup> The overall annual report disclosure quality is on average 62% and has a maximum of 85%.

In Table 6, the disclosure score is grouped by one-digit SIC industries. The Transportation and Public Utilities industry has the highest average disclosure score while Agriculture, Forestry, and Fishing has the lowest score. Overall, there is a huge variation in means as well as standard deviations between the different industries, indicating diverse disclosure strategies.

[Insert Table 5, Table 6, and Table 7 here]

Table 7 shows a Spearman correlation matrix. As expected, *DISCL* is negatively (not significant) correlated with *AEF* and significantly positively correlated with *STDEV*, *d\_LH*, *d\_LH1*, and *d\_LH2*. The correlation between *DISCL* and  $\Delta$ *DTA\_TLC* is significant and has a negative sign. The relatively high correlation between *ROA* and *AEF* of 0.829 is not surprising and reflects the importance of current earnings for future forecasts. However, to avoid multicollinearity problems, we use the percentage change in the companies' EBIT from the previous to the current year ( $\Delta$ *EBIT*) as the measure for profitability in our regression.<sup>24</sup> The high correlation between the different loss history dummies is attributable to the variable construction and does not cause any problems because we use the variables alternatively in our regression.

## Regression Results

We estimate a pooled cross-sectional regression, using Huber-White robust standard errors (reported in parentheses).<sup>25</sup> Table 8 gives an overview of the results of our basic model (Model I) and the respective modifications (Model II – III).

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<sup>22</sup> In the respective five-year period (*d\_LH2*) 32 percent of the observations report at least one negative result.

<sup>23</sup> The difference in mean and median could be an indicator for the influence of outliers. We control for outliers by truncating (winsorizing) the variable  $\Delta$ *DTA\_TLC* below the 1<sup>st</sup> and above the 99<sup>th</sup> percentile. Dropping (changing the values) of seven observations does not change signs or significance of the results.

<sup>24</sup> Including *ROA* results in insignificant coefficients for both, *AEF* and *ROA*. The correlation between *AEF* and  $\Delta$ *EBIT* is significant and positive but much lower (0.1838) than between *AEF* and *ROA*.

<sup>25</sup> If we repeat our analysis with standard errors clustered on year level, results are basically unchanged with a slight decrease in significance.

[Insert Table 8 here]

Consistent with our expectations, the earnings forecast variable *AEF* and the dispersion of earnings forecasts measured by *STDEV* have significant coefficients with the expected signs in all model specifications, robust to including different loss history proxies.<sup>26</sup> The results indicate that uncertainty about future earnings is positively associated with the level of voluntary tax loss carryforward disclosure. Similarly, all loss history variables have significantly positive coefficients, indicating that not only the magnitude (*d\_LH*) but also the mere existence of recent losses (*d\_LH1* and *d\_LH2*) are associated with additional disclosure.

The change in deferred taxes for loss carryforwards (*ADTA\_TLC*) is negatively associated with the disclosure level. The result of a decreasing disclosure level with positive changes in deferred taxes supports our assumption of lower uncertainty if management expects more tax losses to be usable. Alternatively, this finding may be an indicator of a substituting relation between voluntary disclosure and the recognition of deferred tax assets.<sup>27</sup> We expect this substitution effect to be particularly pronounced in our sample due to the traditionally conservative German accounting environment: being restrained in the recognition of deferred taxes, management needs other ways to communicate information about the value of tax loss carryforwards.

Concerning the control variables, *d\_AUD* has a positive and highly significant coefficient in all model specifications. This finding suggests that the choice of the auditor affects tax loss disclosure in a similar way as the overall disclosure, as indicated by previous research.

### **Annual Report Disclosure Quality**

The positive and significant (in Model II and III) coefficient of *AR\_DISCL* indicates a related disclosure behavior regarding tax losses and the entire annual report. This finding could suggest that the tax loss disclosure increases because firms with higher uncertainty increase the overall disclosure level and the tax footnote is only a characteristic of this increase. In this case, our findings would not explain variation of the tax footnote disclosure behavior but would rather be a byproduct of firms' broader disclosure decisions. To examine this case, we estimate our regression again, using the overall disclosure level *AR\_DISCL* as the dependent variable. If firms increase their overall disclosure in the case of uncertainty, we would find similar results for the uncertainty

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<sup>26</sup> The results are robust to excluding one or more control variables (not reported).

<sup>27</sup> We find a Spearman correlation coefficient between *DISCL* and *ADTA\_TLC* of -0.11 (significant at ten percent level).

variables as in our basic model. Results of Model IV-VI for the three different specifications are reported in Table 9.

[Insert Table 9 here]

The results in Table 9 differ completely from our findings in Table 8. While the earnings forecast variable *AEF* is negatively related to *DISCL* in our basic regressions, it now shows a significantly positive coefficient. The dispersion of earnings forecasts and the existence of a loss history have (mainly) insignificant coefficients with signs opposite to our basic model. Hence, the direction of association is reversed for all of our treatment variables, indicating that higher uncertainty generally is related to a (if anything) lower overall disclosure level. At the same time, three of the control variables have a significant relation to *AR\_DISCL*: *SIZE*, *ΔEBIT* and *d\_AUD* have significantly positive coefficients, suggesting that larger, more profitable, and Big-4 audited firms have a higher disclosure level. The finding that our uncertainty measures are oppositely related to the overall annual report disclosure and the tax loss carryforward disclosure indicates that the tax footnote is not just a reflection of the broader annual report disclosure policy.

## 6 Sensitivity Analysis

We conduct several sensitivity analyses to test whether our findings are robust (results not reported). First, we control for the effect of outliers. We truncate all continuous variables above the 99<sup>th</sup> and below the 1<sup>st</sup> percentile.<sup>28</sup> Excluding 28 observations does basically not alter significance levels while the coefficients show a slight increase.<sup>29</sup>

Our second modification refers to the sample selection. In line with previous studies (Chaney and Jeter, 1994; Zeng, 2003; Chluddek, 2011), we exclude bank, insurance and financial companies from our sample (SIC-Code 60-67). Estimating our regression again with the reduced sample has little effect on our results.<sup>30</sup> Similarly, the findings are robust to excluding 44 observations with fiscal year-end other than December 31.

Moreover, we test sensitivity regarding our dependent variable. Using the number of reported items as a quantitative measure instead of the disclosure index *DISCL*, does not change our results qualitatively. This

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<sup>28</sup> Except for *STDEV* and *LEV* which have a natural lower bound at zero and are only truncated at the 99<sup>th</sup> percentile.

<sup>29</sup> Except for one drop in significance for *ΔDTA\_TLC* in Model I (p-value of 0.16). If we winsorize the variables rather than truncating them, results are virtually the same as in the basic regression.

<sup>30</sup> We exclude 52 observations. Again, there is a drop in significance for *ΔDTA\_TLC* in Model I (p-value of 0.16).

finding indicates that the number of disclosures is the driving force of the observed effect. Another concern refers to the classification of disclosures as mandatory or voluntary. Misinterpretation of the disclosure requirements on side of the company can lead to ambiguities. For example, Loitz (2007) finds that companies frequently disclose non-recognized deferred taxes instead of the underlying loss carryforwards which are not usable.<sup>31</sup> According to our classification system, we count the disclosure of non-recognized deferred taxes as a voluntary item though the company maybe intended to report mandatory information. Hence, our disclosure score which is designed to capture management's intention to provide information beyond the requirements might be biased. We try to control for this case by excluding ambiguous items from our disclosure score. As it is impossible to identify every kind of misinterpretation, we try to account for the above mentioned frequent case. If a company discloses the non-recognized deferred taxes but does not report the underlying tax losses, we assume a misinterpretation and the item is not included in the disclosure score of the respective firm-year.<sup>32</sup> In case of the disclosure of both items, we keep the non-recognized deferred taxes as a voluntary item.<sup>33</sup> Results for the modified dependent variable do not differ qualitatively from our basic findings.

## **7 Conclusion**

This study focuses on the relation between the level of voluntary tax loss carryforward disclosure and uncertainty about future income. Assuming that investors require a risk premium if tax loss carryforwards cannot be offset against future earnings and hence are not usable, this uncertainty increases a firm's cost of capital. A reduction of information asymmetries by voluntary disclosure can mitigate this increase. Hence, managers have incentives to report more information about tax loss carryforwards if future income is uncertain. At the same time, costs of gathering and editing the information, as well as proprietary costs can deter firms from disclosing extensive tax details. In this study, we examine whether firms expect net benefits and increase the level of voluntary disclosure with uncertainty about the usability of tax loss carryforwards.

As uncertainty depends primarily on the availability of future earnings to offset losses, we use different direct future estimates and historic indicators related to earnings. We find a strong positive association between disclosure and the dispersion of analyst earnings forecasts, suggesting that companies react to inconclusive

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<sup>31</sup> IAS 12.81 (e) requires the disclosure of unused tax losses for which no deferred tax asset is recognized. The disclosure of the respective deferred taxes is not obligatory.

<sup>32</sup> As a result, we reduce the disclosure scores of 40 observations.

<sup>33</sup> The unused tax losses are not counted anyway because they belong to the mandatory disclosures.



earnings expectations with more (or more salient) tax loss disclosure. Similarly, our results indicate that the tax loss carryforward disclosure level decreases with the amount of forecasted earnings. Taken together these findings indicate a positive association between the disclosure level and uncertainty about future usability of tax losses.

This relation is further supported by the results for a historic indicator of uncertainty, assessing whether the company recently reported a (substantial) loss. Three different measures of a loss history are applied and all indicate an increase in disclosure if a loss is reported. On the one hand, the disclosure level seems to be related to the magnitude of losses, considering the cumulative result of the current and two previous years. On the other hand, also the mere existence of a recent loss irrespective of its magnitude confirms the expected relation. In line with previous research (Amir and Sougiannis, 1999), this finding can indicate support for the signaling effect of losses on expected future earnings.

In sum, we find that companies that are exhibited to greater ex ante uncertainty voluntarily disclose more and more salient information about tax loss carryforwards. These findings are robust for several indicators representing information and income uncertainty. Our findings suggest that managers anticipate the investors' need for more private information and thus disclose them voluntarily to send a signal of credibility to the market participants. It can be assumed that disclosing this information is less costly than facing potential risk premiums demanded by investors.

We contribute to the literature about tax related information in the annual report. Previous studies indicate incomplete and not easily understandable disclosures about taxes that differ remarkably between companies (Evers et al., 2014; Kvaal and Nobes, 2013; Ready et al., 2011). In this study, we try to explain part of the variation. We provide insight in the incentives to disclose tax loss carryforward information and hence an important component of the tax footnote. Our results are consistent with firms adjusting their tax disclosure to the need for information caused by uncertainty. This finding indicates that the incentives to disclose extensive information vary with uncertainty about the future usability of tax loss carryforwards and help to explain why there is broad variation in the tax disclosure behavior of firms.

A potential caveat of our study is that we do not analyze whether the disclosed information does indeed provide the information that is demanded by investors. Moreover, we examine the 80 largest German companies and our findings might not hold for smaller and less liquid firms that could have other disclosure incentives. Hence,

though our findings suggest that firms voluntarily react to investors' information needs, we do not conclude that there is no room or need for improvements in the disclosure requirements.

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## APPENDIX

**Table 1: Sample Selection (years 2005-2010)**

	<u>Firms</u>	<u>Observations</u>
DAX	30	
M-DAX	50	
	80	480
Non-IFRS		37
Missing data		81
<b>Total</b>	76	362

**Table 2: Disclosure Scale**

**Panel A**

<u>Score</u>	<u>Type of Disclosure</u>
0.5	Qualitative
1	Comparative
1.5	Interval
2	Quantitative
+ 1.5	Additional Information
+ 1.5	Using Graph/Table

**Panel B**

<u>Disclosed Information</u>	<u>Type of Disclosure</u>	<u>Score</u>
This year, the company's tax loss carryforwards increased.	Qualitative	0.5
This year, the company's tax loss carryforwards increased by 5 Mio EUR.	Quantitative	2
This year, the company's tax loss carryforwards increased by 5 Mio EUR, resulting primarily from restructuring in the XY subgroup.	Quantitative + Additional Information	3.5

**Table 3: Variable Description**

<b><u>Variable</u></b>	<b><u>Exp. sign</u></b>	<b><u>Description</u></b>
<i>DISCL<sub>it</sub></i>		voluntary tax loss carryforward disclosure score, based on the scale in Table 2
<i>AEF<sub>it</sub></i>	-	mean EBIT forecast for following fiscal year / total assets
<i>STDEV<sub>it</sub></i>	+	standard deviation of earnings per share forecast for following fiscal year
<i>d_LH<sub>it</sub></i>	+	dummy variable: 1 if company reported a cumulative negative EBT in the current and two previous years, 0 otherwise
<i>d_LH1<sub>it</sub></i>	+	dummy variable: 1 if company reported at least one negative EBT in the current or one of the two previous years, 0 otherwise
<i>d_LH2<sub>it</sub></i>	+	dummy variable: 1 if company reported at least one negative EBT in the current or one of the four previous years, 0 otherwise
<i>DTA_TLC<sub>it</sub></i>		deferred tax assets for tax loss carryforwards / total assets
<i>ΔDTA_TLC<sub>it</sub></i>	-	percent change in deferred tax assets for tax loss carryforwards from previous to current year
<i>SIZE<sub>it</sub></i>	+	natural logarithm of total assets
<i>LEV<sub>it</sub></i>	+/-	debt / total assets
<i>ROA<sub>it</sub></i>	+/-	return on assets: calculated as EBIT / total assets of previous year
<i>d_AUD<sub>it</sub></i>	+	dummy variable: 1 if company is audited by Big4 (Deloitte, Ernst & Young, KPMG, PWC), 0 otherwise
<i>IFRS_AD<sub>it</sub></i>	+	years that have passed since the company adopted IAS/IFRS
<i>AR_DISCL</i>	+	disclosure score of annual report content quality
<i>CEO_TO<sub>it</sub></i>	+/-	dummy variable: 1 if CEO changed from previous to current year, 0 otherwise

**Table 4: Voluntary Disclosures**

		<b><u>No. of Observations Disclosing the Item</u></b>	
		<b><u>Absolute</u></b>	<b><u>Percent of total observations</u></b>
<b>Basic TLC information</b>	Total amount of recoverable tax loss carryforwards	52	14%
	Expiry date of recoverable tax loss carryforwards	35	10%
	Total amount of tax loss carryforwards (recoverable and not recoverable)	161	44%
	Expiry date of total tax loss carryforwards	130	36%
<b>Changes and Effect on Income</b>	Explication for changes in tax loss carryforwards or deferred tax assets for loss carryforwards	60	17%
	Income/tax effect of using tax loss carryforwards	62	17%
	Deferred tax income/expense recognized in the current year's income statement due to unused tax losses	99	27%
<b>Valuation Allowance Information</b>	Valuation Allowance for deferred tax assets on loss carryforwards	100	28%
	Income effects of changes in tax loss carryforward valuation allowance	18	5%
	Tax losses for which a valuation allowance is recognized	17	5%
	Amount of deferred tax assets for tax losses which have not been recognized	92	25%
<b>Others</b>	Effect of tax losses on tax reconciliation	180	50%
	Distinction between corporate tax loss and trade tax loss	106	29%
	Reference to minimum taxation	57	16%
	Other disclosures	76	21%



**Table 5: Descriptive Statistics**

	<u>Mean</u>	<u>Median</u>	<u>Std. Dev.</u>	<u>Min</u>	<u>Max</u>	<u>N</u>
<i>DISCL</i>	8.48	6.50	6.76	0	42	362
<i>AEF</i>	0.09	0.08	0.09	-0.20	0.67	362
<i>STDEV</i>	0.43	0.28	0.40	0	3.21	362
<i>d_LH</i>	0.07	0	0.27	0	1	362
<i>d_LH1</i>	0.23	0	0.41	0	1	362
<i>d_LH2</i>	0.32	0	0.46	0	1	362
<i>DTA_TLC</i>	0.01	0	0.04	0	0.31	362
<i>ΔDTA_TLC</i>	0.73	-0.02	3.61	-1	39.52	362
<i>SIZE</i>	22.95	22.70	1.84	18.68	28.42	362
<i>LEV</i>	0.25	0.24	0.16	0	0.75	362
<i>ROA</i>	0.09	0.07	0.09	-0.07	0.65	362
<i>d_AUD</i>	0.91	1	0.29	0	1	362
<i>IFRS_AD</i>	6.06	6	3.17	1	15	362
<i>AR_DISCL</i>	0.62	0.62	0.08	0.36	0.85	362
<i>CEO_TO</i>	0.11	0	0.31	0	1	362

**Variable definitions:**

<i>DISCL</i>	voluntary tax loss carryforward disclosure score, based on the scale in Table 2
<i>AEF</i>	mean EBIT forecast for following fiscal year / total assets
<i>STDEV</i>	standard deviation of earnings per share forecast for following fiscal year
<i>d_LH</i>	dummy variable: 1 if company reported a cumulative negative EBT in the current and two previous years, 0 otherwise
<i>d_LH1</i>	dummy variable: 1 if company reported at least one negative EBT in the current or one of the two previous years, 0 otherwise
<i>d_LH2</i>	dummy variable: 1 if company reported at least one negative EBT in the current or one of the four previous years, 0 otherwise
<i>DTA_TLC</i>	deferred tax assets for tax loss carryforwards / total assets
<i>ΔDTA_TLC</i>	percent change in deferred tax assets for tax loss carryforwards from previous to current year
<i>SIZE</i>	natural logarithm of total assets
<i>LEV</i>	debt / total assets
<i>ROA</i>	return on assets: calculated as EBIT / total assets of previous year
<i>d_AUD</i>	dummy variable: 1 if company is audited by Big4 (Deloitte, Ernst & Young, KPMG, PWC), 0 otherwise
<i>IFRS_AD</i>	years that have passed since the company adopted IAS/IFRS
<i>AR_DISCL</i>	disclosure score of annual report content quality
<i>CEO_TO</i>	dummy variable: 1 if CEO changed from previous to current year, 0 otherwise

**Table 6: Disclosure Score per Industry**

	<u>Mean</u>	<u>Std.Dev.</u>	<u>Min</u>	<u>25<sup>th</sup> perc.</u>	<u>Median</u>	<u>75<sup>th</sup> perc.</u>	<u>Max</u>	<u>N</u>
Agriculture, Forestry, Fishing	1.50	0	1.50	1.50	1.50	1.50	1.50	2
Mining	3.27	2.77	0	0	3.50	5.50	7	11
Construction	6.18	3.05	1.50	3	7.50	7.50	10.50	14
Manufacturing	8.56	5.94	0	4	7	11.50	26.50	198
Transportation & Public Utilities	13.12	11.64	0	5	8.50	18	42	41
Wholesale Trade	7.79	6.28	1.50	3.50	5	14	21.50	14
Retail Trade	6.56	4.69	3	4	5	7	22.50	18
Finance, Insurance, Real Estate	7.75	7.11	0	2	5.50	12.50	36.50	52
Services	6.83	2.31	2	5.75	7	8	10.50	12
Total	8.48	6.98	0	3.50	6.50	42	42	362

**Table 7: Correlation Matrix**

	<i>DISCL</i>	<i>AEF</i>	<i>STDEV</i>	<i>d_LH</i>	<i>d_LH1</i>	<i>d_LH2</i>	<i>ADTA_TLC</i>	<i>SIZE</i>	<i>LEV</i>	<i>ROA</i>	<i>d_AUD</i>	<i>IFRS_AD</i>	<i>AR_DISCL</i>	<i>CEO_TO</i>
<i>DISCL</i>	1.000													
<i>AEF</i>	-0.093	1.000												
<i>STDEV</i>	<b>0.139</b>	<b>-0.194</b>	1.000											
<i>d_LH</i>	<b>0.142</b>	<b>-0.158</b>	-0.061	1.000										
<i>d_LH1</i>	<b>0.112</b>	<b>-0.292</b>	0.084	<b>0.503</b>	1.000									
<i>d_LH2</i>	<b>0.193</b>	<b>-0.232</b>	0.033	<b>0.394</b>	<b>0.783</b>	1.000								
<i>ADTA_TLC</i>	<b>-0.106</b>	-0.070	-0.015	-0.053	<b>0.120</b>	0.037	1.000							
<i>SIZE</i>	<b>0.167</b>	<b>-0.550</b>	<b>0.350</b>	0.016	<b>0.110</b>	0.056	0.025	1.000						
<i>LEV</i>	0.0437	<b>-0.278</b>	<b>-0.119</b>	<b>0.174</b>	<b>0.169</b>	<b>0.149</b>	<b>0.160</b>	<b>0.220</b>	1.000					
<i>ROA</i>	<b>-0.161</b>	<b>0.812</b>	<b>-0.154</b>	<b>-0.252</b>	<b>-0.480</b>	<b>-0.403</b>	<b>-0.117</b>	<b>-0.451</b>	<b>-0.239</b>	1.000				
<i>d_AUD</i>	<b>0.236</b>	<b>-0.161</b>	<b>0.086</b>	0.086	<b>0.126</b>	<b>0.178</b>	0.017	<b>0.374</b>	0.085	<b>-0.188</b>	1.000			
<i>IFRS_AD</i>	0.077	<b>-0.258</b>	<b>0.260</b>	0.043	<b>0.186</b>	<b>0.155</b>	0.081	<b>0.274</b>	-0.042	<b>-0.235</b>	<b>0.233</b>	1.000		
<i>AR_DISCL</i>	<b>0.227</b>	0.012	0.020	-0.038	-0.031	-0.054	0.009	<b>0.255</b>	0.049	0.009	<b>0.250</b>	0.082	1.000	
<i>CEO_TO</i>	-0.084	-0.005	0.016	0.040	0.056	0.033	0.040	0.040	0.049	-0.072	0.053	-0.043	-0.034	1.000

**Notes:**

Spearman correlation matrix. Figures in bold and in italics indicate significance at 5% level.

**Variable definitions:**

<i>DISCL</i>	voluntary tax loss carryforward disclosure score, based on the scale in Table 2
<i>AEF</i>	mean EBIT forecast for following fiscal year / total assets
<i>STDEV</i>	standard deviation of earnings per share forecast for following fiscal year
<i>d_LH</i>	dummy variable: 1 if company reported a cumulative negative EBT in the current and two previous years, 0 otherwise
<i>d_LH1</i>	dummy variable: 1 if company reported at least one negative EBT in the current or one of the two previous years, 0 otherwise
<i>d_LH2</i>	dummy variable: 1 if company reported at least one negative EBT in the current or one of the four previous years, 0 otherwise
<i>ADTA_TLC</i>	percent change in deferred tax assets for tax loss carryforwards from previous to current year
<i>SIZE</i>	natural logarithm of total assets
<i>LEV</i>	debt / total assets
<i>ROA</i>	return on assets: calculated as EBIT / total assets of previous year
<i>d_AUD</i>	dummy variable: 1 if company is audited by Big4 (Deloitte, Ernst & Young, KPMG, PWC), 0 otherwise
<i>IFRS_AD</i>	years that have passed since the company adopted IAS/IFRS
<i>AR_DISCL</i>	disclosure score of annual report content quality
<i>CEO_TO</i>	dummy variable: 1 if CEO changed from previous to current year, 0 otherwise

**Table 8: Regression Estimates Model I-III (dependent variable: DISCL)**

	I	II	III
<i>Constant</i>	-3.994 (5.923)	-1.606 (6.228)	-3.007 (6.177)
<i>AEF</i>	-10.782** (4.205)	-10.091** (4.025)	-9.649** (3.958)
<i>STDEV</i>	2.564** (1.029)	2.532** (1.034)	2.633** (1.026)
<i>d_LH</i>	5.978*** (2.130)		
<i>ADTA_TLC</i>	-0.128* (0.070)	-0.161** (0.078)	-0.150** (0.076)
<i>SIZE</i>	0.039 (0.252)	-0.047 (0.261)	0.028 (0.262)
<i>ΔEBIT</i>	-0.011 (0.016)	-0.008 (0.019)	-0.006 (0.019)
<i>LEV</i>	-3.534 (2.415)	-3.358 (2.397)	-3.661 (2.397)
<i>d_AUD</i>	2.656*** (0.861)	2.937*** (0.863)	2.279** (0.880)
<i>IFRS_AD</i>	0.021 (0.127)	-0.025 (0.126)	-0.042 (0.123)
<i>AR_DISCL</i>	6.222 (3.829)	6.364* (3.850)	7.287* (3.868)
<i>CEO_TO</i>	-1.448 (1.079)	-1.458 (1.051)	-1.385 (1.001)
<i>d_LH1</i>		2.603** (1.116)	
<i>d_LH2</i>			3.239*** (0.853)
R <sup>2</sup>	0.212	0.189	0.208
N	362	362	362
F-value	7.04	6.67	7.39

Notes:

Robust standard errors in parentheses. Year and industry dummies included but not reported.

\*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% respectively

**Variable definitions:**

<i>DISCL</i>	voluntary tax loss carryforward disclosure score, based on the scale in Table 2
<i>AEF</i>	mean EBIT forecast for following fiscal year / total assets
<i>STDEV</i>	standard deviation of earnings per share forecast for following fiscal year
<i>d_LH</i>	dummy variable: 1 if company reported a cumulative negative EBT in the current and two previous years, 0 otherwise
<i>d_LH1</i>	dummy variable: 1 if company reported at least one negative EBT in the current or one of the two previous years, 0 otherwise
<i>d_LH2</i>	dummy variable: 1 if company reported at least one negative EBT in the current or one of the four previous years, 0 otherwise
<i>ADTA_TLC</i>	percent change in deferred tax assets for tax loss carryforwards from previous to current year
<i>SIZE</i>	natural logarithm of total assets
<i>ΔEBIT</i>	percent change in EBIT from the previous year to the current year
<i>LEV</i>	debt / total assets
<i>d_AUD</i>	dummy variable: 1 if company is audited by Big4 (Deloitte, Ernst & Young, KPMG, PWC), 0 otherwise
<i>IFRS_AD</i>	years that have passed since the company adopted IAS/IFRS
<i>AR_DISCL</i>	disclosure score of annual report content quality
<i>CEO_TO</i>	dummy variable: 1 if CEO changed from previous to current year, 0 otherwise

**Table 9: Regression Estimates Model IV-VI (dependent variable: AR\_DISCL)**

	IV	V	VI
<i>Constant</i>	0.261*** (0.068)	0.256*** (0.067)	0.262*** (0.068)
<i>DISCL</i>	0.001 (0.000)	0.001 (0.000)	0.001* (0.000)
<i>AEF</i>	0.139** (0.061)	0.131** (0.063)	0.129** (0.064)
<i>STDEV</i>	-0.005 (0.010)	-0.004 (0.010)	-0.005 (0.010)
<i>d_LH</i>	-0.017 (0.018)		
<i>ADTA_TLC</i>	-0.001 (0.001)	-0.000 (0.001)	-0.001 (0.001)
<i>SIZE</i>	0.008*** (0.003)	0.008*** (0.003)	0.008*** (0.003)
<i>ΔEBIT</i>	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
<i>LEV</i>	0.023 (0.025)	0.026 (0.025)	0.028 (0.025)
<i>d_AUD</i>	0.059*** (0.016)	0.059*** (0.016)	0.062*** (0.016)
<i>IFRS_AD</i>	0.002 (0.001)	0.002* (0.001)	0.003* (0.001)
<i>CEO_TO</i>	-0.009 (0.011)	-0.009 (0.011)	-0.009 (0.011)
<i>d_LH1</i>		-0.016 (0.010)	
<i>d_LH2</i>			-0.019** (0.010)
R <sup>2</sup>	0.248	0.251	0.255
N	362	362	362
F-value	9.49	10.54	10.41

Notes:

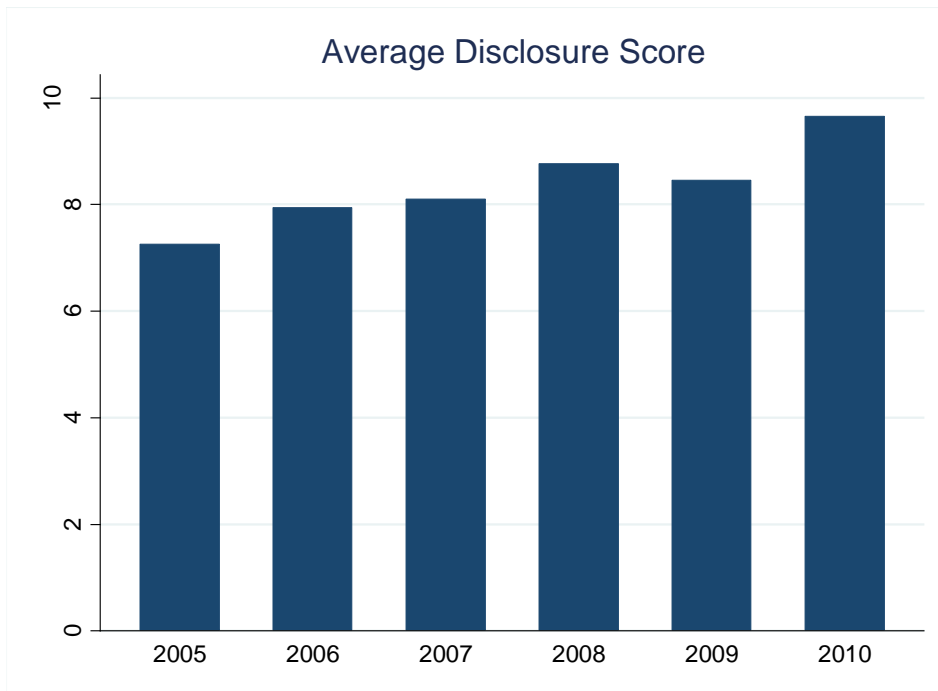
Robust standard errors in parentheses. Year and industry dummies included but not reported.

\*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% respectively

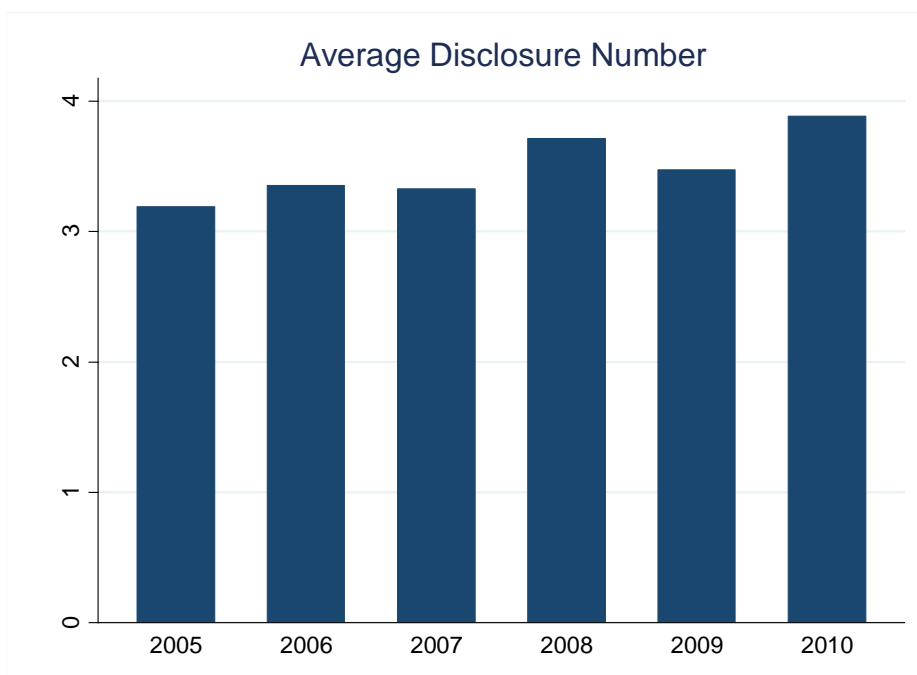
**Variable definitions:**

<i>DISCL</i>	voluntary tax loss carryforward disclosure score, based on the scale in Table 2
<i>AEF</i>	mean EBIT forecast for following fiscal year / total assets
<i>STDEV</i>	standard deviation of earnings per share forecast for following fiscal year
<i>d_LH</i>	dummy variable: 1 if company reported a cumulative negative EBT in the current and two previous years, 0 otherwise
<i>d_LH1</i>	dummy variable: 1 if company reported at least one negative EBT in the current or one of the two previous years, 0 otherwise
<i>d_LH2</i>	dummy variable: 1 if company reported at least one negative EBT in the current or one of the four previous years, 0 otherwise
<i>ADTA_TLC</i>	percent change in deferred tax assets for tax loss carryforwards from previous to current year
<i>SIZE</i>	natural logarithm of total assets
<i>ΔEBIT</i>	percent change in EBIT from the previous year to the current year
<i>LEV</i>	debt / total assets
<i>d_AUD</i>	dummy variable: 1 if company is audited by Big4 (Deloitte, Ernst & Young, KPMG, PWC), 0 otherwise
<i>IFRS_AD</i>	years that have passed since the company adopted IAS/IFRS
<i>AR_DISCL</i>	disclosure score of annual report content quality
<i>CEO_TO</i>	dummy variable: 1 if CEO changed from previous to current year, 0 otherwise

**Figure 1: Development of Disclosure Score over sample period**



**Figure 2: Development of Disclosure Number over sample period**



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