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Compliance with Taxonomy Regulation Disclosures in the German Insurance Market During the Eligibility Transition Period

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Abstract

This paper aims to provide an essential concluding overview of the transitional period of disclosure under the Taxonomy Regulation in the German insurance market. In addition, key figures regarding taxonomy-eligibility are presented, compliance with the required disclosure obligations is measured, and individual exogenously observable factors are examined concerning their contribution to a tendency towards fully compliant reporting. The results provide clues for stakeholders, standard setters, regulators, and the insurance companies themselves as to when an insurance group is expected to deliver fully compliant taxonomy reporting. It can be concluded that size, organizational form, voluntary independent audits, and the place chosen for publication are linked to the extent of compliance with the disclosure requirements. In this context, those indicators may also be used to identify from which market participants can expect a fast and high-quality adaptation to future sustainability-related reporting.

Zusammenfassung

Ziel dieses Beitrags ist es, einen abschließenden Überblick über die Übergangszeit der Berichterstattung nach der Taxonomieverordnung auf dem deutschen Versicherungsmarkt zu geben. Darüber hinaus werden Kennzahlen zur Taxonomiefähigkeit dargestellt, die Einhaltung der geforderten Offenlegungspflichten gemessen und einzelne exogen beobachtbare Faktoren auf ihren Beitrag zu einer tendenziell vollständig konformen Berichterstattung untersucht. Die Ergebnisse liefern Anhaltspunkte für Stakeholder, Standardsetzer, Regulierungsbehörden und die Versicherungsunternehmen selbst, wann von einem Versicherungskonzern eine vollständige Taxonomie-Berichterstattung zu erwarten ist. Es lässt sich feststellen, dass Größe, Rechtsform, freiwillige unabhängige Prüfungen und der für die Veröffentlichung gewählte Ort mit dem Ausmaß der Einhaltung der Offenlegungsanforderungen zusammenhängen. In diesem Zusammenhang können diese Indikatoren auch dazu verwendet werden, um festzustellen, von welchen Marktteilneh-

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mern eine schnelle und qualitativ hochwertige Anpassung an zukünftige nachhaltigkeitsbezogene Berichterstattung erwartet werden kann.

1. Introduction

With the introduction of the Taxonomy Regulation (EU) 2020/852 as part of the European Green Deal (European Commission 12/11/2019), the European Commission has laid a building block to create a set of rules to establish a standardized categorization of all economic activities regarding their environmental sustainability. The expansion of the disclosure requirements in the non-financial statement by the Taxonomy Regulation also extends the reporting obligations for insurance companies, taking into account the specific characteristics of the insurance sector. Previous studies concluded that reliable sustainability-related information can positively affect shareholders by increasing shareholder and stakeholder value (Miralles-Quirós et al. 2019; Freudenreich et al. 2020). Similarly, disjointed and heterogeneous sustainability reports, which also include reports without uniform qualitative mandatory requirements, are largely exposed to a higher risk of greenwashing, information overload, and decreased decision usefulness to investors and other stakeholders (Gerwanski et al. 2019; Rinaldi et al. 2018; Miller 2010). Therefore it could be concluded that a high quality of reporting per the Taxonomy Regulation could positively impact shareholder value and reduce the risk of greenwashing.

In addition to the sustainability risks and opportunities for insurance companies (Gatzert et al. 2020), a new field of reporting obligations is beginning to open up for insurance companies by considering the nature of the insurance business. Those reporting obligations can be clustered into those arising from the Sustainable Finance Disclosures Regulation (SFDR)[1], Taxonomy Regulation, and sector agnostic and sector-specific European Sustainability Reporting Standards (ESRS), introduced by Art. 1 (8) Corporate Sustainability Reporting Directive (CSRD)[2]. To be able to deliver the intended added value for stakeholders and shareholders, it is necessary that the reporting is at a qualitatively high level.

This study aims to identify factors related to the quality of sustainability reporting by using the reporting requirements in force during the (first) taxonomy-eligible transition period of the Taxonomy Regulation for the environmental objectives climate change mitigation and adaption. Thereby relating exclusively

[1] Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019.

[2] Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022.

to the concrete requirements of the Taxonomy Regulation and its delegated legal acts in the non-financial statement. However, it can be assumed that the factors examined can also have an impact on other branches of sustainability-related reporting. Most prominent among these is the future sustainability report in accordance with the ESRS.

The factors used to determine the quality of reporting in Germany are the insurance group's size, the parent company's legal form, the chosen location of the reporting, and the verification of the information by an independent auditor. Learning and spillover effects from one year to the next are also considered. In order to make the quality of reporting measurable, the degree of compliance with the required disclosures is used as an approximation.

Research in the field of sustainability reporting quality and compliance in the financial sector has yet to be exhaustively investigated. One recent study focused on the compliance of non-financial disclosures in the banking sector in Italy (Veltri et al. 2023). To the best of the authors' knowledge, by September 2023, no studies have examined compliance with transitional measures of the Taxonomy Regulation for non-financial and financial undertakings. This publication intends to fill this gap for the German insurance market and give an overview of the industry's adaption to those new sustainable reporting requirements.

The paper is structured as follows:

After this introduction, the disclosure requirements for the 2-year transition period are presented in Chapter 2. Subsequently, the hypotheses to be tested are set up, which are expected to influence the degree of compliance, which is considered an indicator of quality. Chapter 3 addresses the criteria for when a reporting requirement was considered to be met. Furthermore, the hierarchical multinomial logistic and probistic regression structure is presented, and the explanatory variables are described. The results in Chapter 4 are divided into a descriptive and a part for evaluating the regression. The descriptive part presents the distribution, variation, and method used for deriving the quantitative KPI. The paper closes with a summary of the results.

2. Disclosure Requirements of Insurance Companies According to the Taxonomy Regulation and Derived Hypotheses

2.1 Reporting Obligations of Insurance Companies under the Taxonomy Regulation in the Transition Period

Insurance companies as financial undertakings which are subject to the obligation to publish a (consolidated) non-financial statement (from 2024 onwards sustainability report) pursuant to Art. 19a or respectively, Art. 29a of the Ac-

counting Directive[3] have to meet the disclosure requirements set out in Art. 8 of the Taxonomy Regulation[4] and its corresponding delegated acts, being the Disclosures Delegated Act (DDA)[5] and the Climate Delegated Act (CDA)[6]. For the two financial years 2021 and 2022, financial companies have been granted transitional arrangements under Art. 10 (3) of the DDA, which pose lower requirements in extent and depth to the full scope of the reporting obligations under the Taxonomy Regulation.

While the Taxonomy Regulation introduced three new indicators for corporate companies to measure a company's environmental sustainability (namely CapEX, OpEX and Turnover-KPI), separate Key Performance Indicators were introduced for financial undertakings. For insurance companies, these KPIs are given by the underwriting and investment KPI accordant to Annex IX & X DDA. In the transition period, only taxonomy-eligible KPIs must be disclosed instead of reporting taxonomy-aligned economic activities and risk exposures. The quantity of required information from Art. 10 (3) in connection with Annex XI DDA for insurance companies is shown in Table 1.

Table 1

Taxonomy disclosure requirements for insurance companies for the fiscal years 2021 and 2022

No.	Legal Basis	Disclosure Requirement
1	Art. 10 (3) lit. a DDA	Proportion in total assets of exposures to Taxonomy-eligible economic activities
2		Proportion in total assets of exposures to Taxonomy non-eligible economic activities
3	Art. 10 (3) lit. b DDA	Proportion in total assets of exposures to central governments, central banks and supranational issuers
4		Proportion in total assets of exposures to Derivatives
5	Art. 10 (3) lit. c DDA	Proportion in total assets of exposures to undertakings that are not obliged to publish non-financial information pursuant to Art. 19a or 29a of the Accounting Directive

[3] Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013.

[4] Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020.

[5] Commission Delegated Regulation (EU) 2021/2178 of 6 July 2021.

[6] Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021.

6	Art. 10 (3) DDA	Proportion of Taxonomy-eligible non-life insurance economic activities[7]
7		Proportion of Taxonomy non-eligible non-life insurance economic activities
8	Annex XI DDA	Contextual information in support of the quantitative indicators, including the scope of assets and activities covered by the KPIs, information on data sources and limitation
9		Explanations of the nature and objectives of Taxonomy-aligned economic activities and the evolution of the Taxonomy-aligned economic activities over time, starting from the second year of implementation, distinguishing between business-related and methodological and data-related elements
10		Description of the compliance with Regulation (EU) 2020/852 in the financial undertaking's business strategy, product design processes and engagement with clients and counterparties
11		Additional or complementary information in support of the financial undertaking's strategies and the weight of the financing of Taxonomy-aligned economic activities in their overall activity

After closer examination of the requirements, it becomes apparent that the requirement within point No. 9 from Table 1 is a requirement that is to be implemented intrinsically at a later point in time, namely for the first time for the fiscal year 2024.

During and after the transition period for the financial years 2021 and 2022, it will be of interest to stakeholders such as standard setters, regulators, the public, and shareholders to know which factors are conducive to high-quality taxonomy reporting. Previous research has shown that customers are willing to pay an extra premium related to "green" Products/Bonds (MacAskill et al. 2021; Chekima et al. 2016; Ronald Drozdenko et al. 2011). Therefore, in the insurance business context, customers may tend to sign policies with insurance groups associated with financing and insuring "green" economic activities under the Taxonomy Regulation.

[7] Note that the regulation text does not further specify whether it means insurance revenue, premiums written or earned.

2.2 Possible Factors Driving Taxonomy Reporting Quality

Due to the rapidly evolving nature of the topic, it is relevant for standard setters to know which factors favor a qualitatively comprehensive implementation of their requirements. For stakeholders, the certainty of high quality is necessary to be able to regard the required information as reliable. For regulators, factors that indicate low-quality reporting can indicate whether insurance companies with such characteristics are at increased risk of greenwashing since they do not correctly identify and interpret the requirements and thus may report misleadingly.

Previous research has shown that CSR-Reporting positively impacts the forecast accuracy of earnings from analysts (Dhaliwal et al. 2012). Building on that research, shareholders could expect better predictive results in their earnings participation, provided that the insurance group delivers high-quality taxonomy reporting that better reflects environment-related insured risks as well as exposures to taxonomy-eligible/-aligned economic activities.

The following factors are considered for measuring which exogenous factors can influence the degree of compliance with the new taxonomy disclosure requirements:

1. the size of the insurance group. The size of the group could significantly impact the quality of compliance with the scope disclosure requirements. This may be since large insurance groups have aligned their business organization to respond appropriately to emerging compliance requirements. It may be easier for them to assume the costs of investments in reporting systems and resources needed for comprehensive compliance into those new regulations. In non-financial contexts, such dependencies were already observed (Lee 2017; Frias-Aceituno et al. 2013).

$H_{0|1}$: The size of an insurance group has no positive influence on the quality of taxonomy reporting.

2. the legal form. Schuh and Noth 2022 have shown that differences in the legal form can explain differences in the risk appetite of insurance companies. Therefore, in the case of emerging compliance requirements, it can be assumed that mutual and public law insurance companies have different objectives in communicating sustainability information and compliance with the new requirements. Due to the stakeholder-based design of the two company forms, the stakeholders' pressure may lead to the delivery of high-quality taxonomy reporting in line with the results of (Vitolla et al. 2019).

$H_{0|2}$: Insurance groups under public law or mutual insurance groups do not show higher quality in their taxonomy reporting compared to stock corporations.

3. the place of publication. Whether a disclosure in a separate report that contains only non-financial and largely unregulated disclosures or a disclosure in the management report together with financial disclosures that are to a great extend already highly regulated could impact the degree of compliance. Therefore, compliance in an already regulated report may be expected to be higher than in an unregulated separate report.

$H_{0|3}$: The choice of publication location of the taxonomy reporting in the management report has no higher quality compared to a separate non-financial report.

4. substantive testing by an independent auditor. Currently[8] it is no mandatory requirement that the content of the non-financial statement, and thus its formal completeness and correctness of the Taxonomy-related disclosure requirements, has to be certified by an independent auditor. Insurance companies are free to commission an independent auditor to audit their non-financial statements by extending their audit engagement in connection with the audit of the annual financial statements. In the study of Gerwanski et al. (2019), the assurance of non-financial information had a measurable positive impact on the integrated reporting quality, which is a subset of the assurance engagements in this study. Further studies suggest that audited sustainability-related reporting exerts a greater influence on investors than unaudited ones (Shen et al. 2017; Frias-Aceituno et al. 2013). Therefore, an independent audit might suggest an impact on compliance with the transitional requirements not only in the integrated reporting framework.

$H_{0|4}$: The audit of the disclosures by an independent auditor in the non-financial statement does not positively impact the quality of the taxonomy reporting.

5. subsequent year. It is expected that the reporting from the following year of the initial application should not show lower compliance. Rather, it can be assumed that learning and/or spillover effects from other market participants will improve the presentation and completeness of the information presented.

$H_{0|5}$: Subsequent year reporting does not improve the taxonomy reporting quality as time passes.

The null hypotheses are chosen in a way that they allow one-sided hypotheses testing, which leads to a more efficient rejection given the previously stated assumptions.

[8] With the implementation of the CSRD, there will be an external audit requirement for the sustainability report, initially with limited and later with reasonable assurance.

3. Methodology

To make compliance with the reporting obligations measurable, each of the disclosure requirements in Table 1 is assigned one point. Taking into account the exclusion of point No. 9 from Table 1, a maximum number of 10 points per insurance group can be achieved. The sum of the disclosures made in the consolidated non-financial statements in accordance with Art. 29a of the Accounting Directive is referred to below as the "Total Compliance Score".

Only reports published up to and including July 31, 2023 were considered.

3.1 Criteria for Determining Compliance

Considering that the awarding of points is as free as possible from any judgment, the following are the criteria used as guidelines for recognizing a fulfilment of a reporting obligation described in Table 1.

For the quantitative disclosure requirements No. 1–7 of Table 1 were seen as fulfilled if the corresponding ratio was reported. The only exception from this rule were cases in which the undertaking deliberately reported an exposure of 0 without giving a reasonable explanation on why this would be adequate. As in this case it can be assumed that no proper assessment of the subject of report has taken place which would lead to a possible misinterpretation of the analysis conducted in chapter 4.

The evaluation is based on the reporting obligation pursuant to Art. 29a of the Accounting Directive. Therefore, it was ensured during the evaluation that the reported information was provided at Group level. Accordingly, disclosures relating only to the individual companies of the Group were considered non-compliant.

Some of the insurance groups in the German insurance market have several mutual insurance companies at the top of the Group. Under German law, these form a so-called "Gleichordnungskonzern". Since under the Accounting Directive such a group structure is to be considered as separate groups of the individual parent mutual insurance companies (in contrast to the regulatory group structure under Solvency II), there are several group-related taxonomy disclosures for an individual group under Solvency II. In the evaluation, the reporting at group level was always selected in a way which includes insurance companies of the non-life insurance sector.

The author recognizes that the recognition of qualitative disclosure requirements is more prone to judgmental biases than factual ratios. Lacking further concretization such as minimum requirements from a public entity regarding eg. minimum content the following criteria were used in a generous way.

No. 8 Table 1: The obligation was seen as fulfilled if the report provided the reader with a sense of how the necessary data was collected, including the source from which it was obtained. Mostly expected to be seen in the part of the report regarding taxonomy-eligible assets.

No. 10 Table 1: The obligation was seen as fulfilled if the report stated an explicit reference to product design. Since product design is a topic which the insurance undertaking can properly define for itself the reporting requirement is expected to be seen in the part of the report regarding taxonomy-eligible non-life insurance activities.

No. 11 Table 1: The obligation was seen as fulfilled if the report stated an explicit reference to financing sustainable economic activities in any way. The information is mostly expected to be seen in the part of the report regarding taxonomy-eligible assets.

3.2 Structural Form of the Regression Model

A hierarchical multinomial logistic and probistic regression is used to measure which of the five explanatory variables mentioned above are associated with a high degree of taxonomy compliance.

A data-based approach is used to divide the groups for the application of the regression. In this approach, the companies are divided into five groups based on the distribution of the total compliance score according to their corresponding quantiles in the fiscal year 2021. The choice of five groups was made to be able to differentiate between a middle group and two better or worse groups. The Total Compliance Scores from the second reporting period are ranked using the same quantile limits of the reporting year 2021. This makes it possible to measure any improvements or deteriorations from the first year of application to the following year.

This approach ensures that the classification is value-free, as it should be remembered that differences in the quality of reporting are not to be interpreted by gaps between the total compliance scores. It can only be stated that a higher total compliance score indicates a higher degree of compliance with the taxonomy reporting, which is used as a proxy for their quality. The quantiles are given the designations A through E, with the top quantile given the designation A and the bottom quantile given the designation E.

Using multinomial logistic and probistic regression, the model structure is as follows.

$$Rank_i = \begin{cases} A, -\infty < y_i^* \leq \gamma_1 \\ B, \gamma_1 < y_i^* \leq \gamma_2 \\ C, \gamma_2 < y_i^* \leq \gamma_3 \\ D, \gamma_3 < y_i^* \leq \gamma_4 \\ E, \gamma_4 < y_i^* < \infty \end{cases}$$

with

$$(1) \quad y_i^* = \beta_1 Size_i + \beta_2 VVAG_i + \beta_2 OffR_i \beta_3 MR_i + \beta_4 Audit_i + \beta_5 FY_i + \in_i$$

The choice of the distribution of $\in_i$ determines the type of regression. The choice of $\in_i \sim logistic\left(0, \frac{\pi^2}{3}\right)$ in (1) results in a logistic regression with interpretable coefficients, respectively the choice of $\in_i \sim N(0,1)$ in a probistic regression with no such interpretation (McCullagh and Nelder 1999; Long 2011).

In logistic regression, the estimates for the β_i's are interpretable according to the marginal effects in the log-odds. This means that, for example, an estimate of $\beta_4 = 0.5$ of a Dummy Variable indicates that the log-probability of having a ranking of A as opposed to B, expressed by $ln\left(\frac{P(Rank_i = A)}{P(Rank_i = B)}\right)$, increases the total difference in the Probabilities by $e^{0.5} \approx 1.6487$. Note that a $\beta_i = 0$ doesn't have an impact to the proportionate probabilities. Accordingly in this case a 1% of a explanatory variable corresponds to an increase in the probabilities of around 0,5%.

The corresponding likelihood functions are maximized w.r.t. (β_i, γ_i) using MATLAB.

3.3 Explanatory Variables Used

$Size_i$: The size of an insurance group is measured by the *ln(Premiums)* written by the insurance group as a whole. The data used were provided by the market share statistics of the KIVI GmbH.

$VVAG_i$ and *$OffR_i$*: Dummy variable which is 1 if either the Parent company is a mutual (*$VVAG_i$*) or a public law (*$OffR_i$*) insurance group, respectively, or 0 if the Parent company is a stock company. The classification of insurance groups was based on KIVI market share statistics.

Mr_i: Dummy variable, which is 1 if the place of publication of the taxonomy reporting requirements was the management report or 0 if the disclosure was

contained in a separate report in accordance with Art. 29 (4) Reporting Directive in the old version.[9]

$Audit_i$: Dummy variable, which is 1 if the disclosures have been subjected to an audit by an independent provider of assurance services with at least limited assurance. The dummy variable is 0 if the disclosures have only been subjected to a formal audit in connection with Art. 29a (5) Accounting Directive in the old version.

FY_i: Dummy Variable which is 1 if the Ranking is from the second year in the Transition Period, it is 0 otherwise.

4. Results

4.1 Descriptive Statistics

Figure 1 shows the distribution of the taxonomy-eligible non-life insurance economic activities of those 41 insurance groups which reported them either for the fiscal year 2021 or 2022 out of the 48 obligated groups. The Viridium and Swiss Life groups which only operate in the life segment are not included. It is observed that percentages range from as low as around 5% up to around 90% fairly uniformly and consistently in the two reporting years. If stated, the proportion was related to the gross written premiums most of the time. Therefore, no clear concentration of taxonomy-eligible non-life insurance activities can be identified in the German insurance market.

In the financial year 2022, 29 (28 in 2021) insurance groups have provided the KPI for eligible and non-eligible activities. In all but one case, the sum of both KPIs was 100%. Thus, for this indicator, a uniform understanding of the differentiation of the two numerators in the market can be observed.

Significant Changes in the taxonomy-eligible activities from 2021 to 2022 in VGH, VK Bayern, and Öffentliche Braunschweig were solely attributed to changes in the methodology of declaring insurance premiums as taxonomy-eligible, since the CDA does not specify that all insurance premiums from the eight specified Solvency II Lines of Businesses (LoB)[10] are taxonomy-eligible but only those which are "related to the underwriting of climate-related perils set

[9] Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 last amended by the Directive (EU) 2021/2101 of the European Parliament and of the Council of 24 November 2021.

[10] Taxonomy-eligible LoB being: medical expense insurance; income protection insurance; workers' compensation insurance; motor vehicle liability insurance; other motor insurance; marine, aviation and transport insurance; fire and other damage to property insurance; assistance.

out in Appendix A" of Annex II CDA[11]. This circumstance allows insurance undertakings to use different approaches to classify their non-life premiums. The industry and its auditors are aware of this fact, which is why the Institute of German Certified Public Accountants (IDW) demands that the insurance company clearly explains its approach to calculating the indicator (IDW 2023a, pp. 43–44). At present, September 2023, the author is not aware of any further concretization by a public body that has issued more precise specifications for the classification of taxonomy-eligible insurance premiums. Accordingly, different classification procedures can be observed in the market, in so far as they have been provided in the non-financial statements.

In general, the Underwriting KPI for Taxonomy-eligible non-life insurance economic activities is defined as

$$\frac{Taxonomy-eligible\ non\ life\ premiums_t}{Total\ non-life\ premiums_t}$$

One of the common approaches in determining the share of taxonomy-eligible premiums is that all insurance premiums are declared as taxonomy-eligible if at least one of the corresponding insurance tariffs covers one of the climate hazards defined in Appendix A of Annex II CDA. Thereby some groups have made a distinction in this approach between explicit coverage of climate hazards, such as hail damage, in other motor insurance and implicit coverage, such as an accident in motor liability due to weather events such as black ice. For some groups, this differentiation leads to the premiums from underwriting implicit climate-related perils not being included in the numerator of the taxonomy-eligible KPI.

A different mentionable approach includes declaring premiums eligible on a product level where the premium of the different insurance tariffs, which the group deemed eligible, were added to form the nominator of the KPI.

In total 29.17% of all 48 insurance groups used in 2021 (28.89% for 2022 with 45 groups) the approach with all eight LoB being declared as taxonomy-eligible. Of those remaining 34 groups which chose a different approach in 2021, 44.12% explained it sufficiently for the reader to understand the methodology chosen (32 groups with 43.75% in 2022). The remaining population either did not explain their methodology in any way or did not do so in a conclusive manner.

Figure 2 shows proportion of total assets of exposures to taxonomy-eligible economic activities. In the second reporting year, it was noticeable that 23.4% of 47 groups had already made a distinction in taxonomy-eligible reporting be-

[11] These climate-related hazards are: temperature-related, wind-related, water-related, solid mass-related.

tween CapEX-based and turnover-based calculation of the capital investment KPI. In 2021, not a single group made such a distinction. The percentages shown in Figure 2 always refer to the CapEx based KPI, if the group opted to differentiate in preparation to taxonomy-aligned reporting.

It should be noted that the accounting policies used for the valuation of assets in the various reports differ. During the evaluation it was observed that accounting principles according to national law, Solvency II and IFRS were used.

Notable the information given vary more widely from 2021 to 2022 than the ones from Figure 1. The largest percentage increase is observed by the DEVK Group from 0.2% in 2021 to 26.3% in 2021 resulting in an increase of 26.1% closely followed by a delta of 24.2% from 33.8% to 58% at W&W Group. The most common explanation for why the data fluctuate so much compared to the previous year is that companies have improved their data availability compared to the previous year.

Regarding data availability, a significant improvement was observed regarding the ratio of non-NFRD exposures to total assets.[12] For 2021, 44% of the 50 groups examined did not publish the ratio. In 2022 the ratio was nearly cut in half being 23.4% of the 47 groups not reporting the ratio. As exposures to companies that are not required to disclose non-financial information are necessary for calculating the taxonomy compliant investment KPI according to Art. 7 (3) CDA, it can be concluded that the market is in the process of establishing appropriate processes to identify such exposures. Nevertheless, a non-disclosure rate of almost one quarter of the total population indicates greater challenges in identifying such exposures. This is likely due to the fact that this disclosure represents a new approach to the classification of risk exposures. In contrast, the identification of risk exposures to central governments, central banks and supranational issuers (Table 1 No. 3) and derivatives (Table 1 No. 4) were already required for existing reporting purposes. Their non-disclosure rates in 2022 are 17.02% (2021: 22%) for exposures to central governments, central banks, and supranational issuers and for 12.77% (2021: 28%) derivatives respectively.

In contrast to the underwriting KPI, there is no clear consensus in the reports on whether taxonomy-eligible and non-taxonomy-eligible assets must add up to 100% in total for the investment KPI. In 2022, 31.7% of the taxonomy-eligible and non-taxonomy-eligible total assets of the 41 groups from which both indicators were provided added up to 100% (in 2021, the ratio was 37.14% for 35 groups).

[12] Reporting Obligation No. 5 Table 1.

The investment KPI must, however, also be viewed under the premise that not all insurance groups have always selected the same reference value for the denominator in the two reporting years. According to the wording of the delegated regulation, the reference figure is Total Assets, see Table 1 No. 1 & 2. In the taxonomy-aligned reporting, total assets are not selected as the reference value but total investments, as exposures to central governments, central banks and supranational issuers shall not be included in the numerator and denominator according to Art. 7 (1) CDA. In the FAQ from 06.10.2022 of the European Commission, it was conceded that financial companies should take a similar reference figure in the denominator to that of the taxonomy conformity reporting to ensure a better consistency of presentation (European Commission 2022, p. 14). In total, 17.02% of 47 groups have chosen total assets as a benchmark in 2022, compared to 26% of 50 in 2021. The remaining groups either did not disclose their benchmark or chose to disclose in relation to total investments.

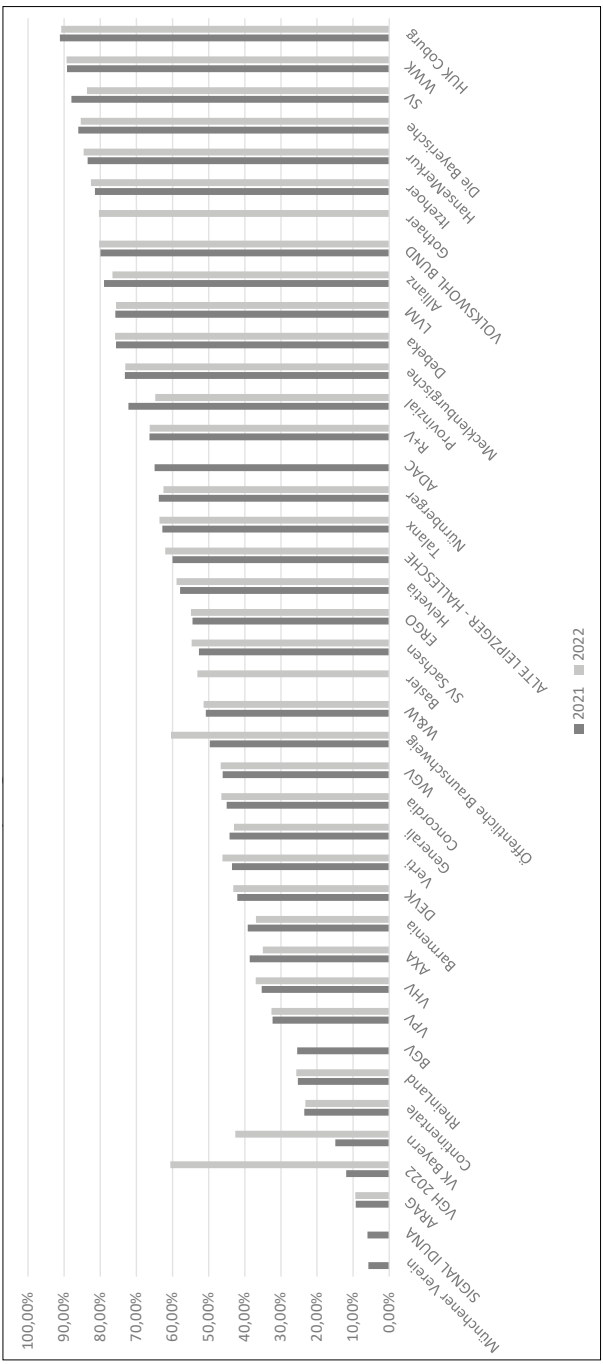

Figure 1: Taxonomy-eligible non-life economic activities

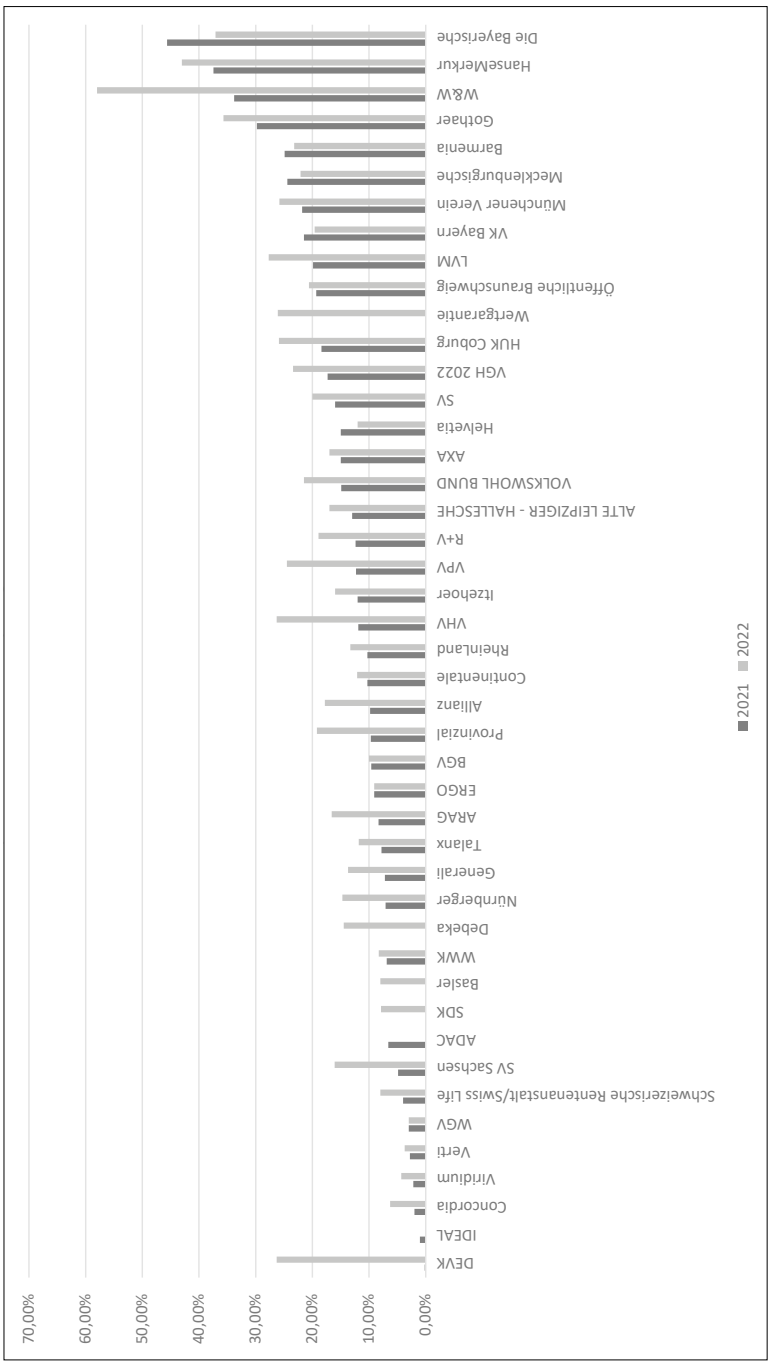

Figure 2: Proportion of total assets of exposure to Taxonomy-eligible economic activities

4.2 Regression Results

Prior to performing the regression, the insurance groups were divided into 20% quantile groups based on their total compliance score. The boundaries of the subsequent ranks are shown in Table 2.

Table 2

20% quantile boundaries for the distribution of the total compliance score

Ranking	Total compliance Score
E	≤4
D	≤7
C	≤8
B	≤9
A	>9

Typically, Qualitative Data No. 10 & 11 according to Table 1 were omitted when evaluating the reports. Therefore, the qualitative data in combination with the data on non-NFRD exposures are usually of particular importance for a ranking in the top three quantiles. It is emphasized here that other combinations of missing data may well have occurred instead of the data points just described.

The subsequent ranking of the insurance groups for the years 2021 and 2022 is shown in Table 3.

The results of the regression described in Chapter 2 are shown in Table 4. It can be observed that all explanatory variables have a significant positive influence in both model specifications, although in some cases only with a significance level of 10%. Accordingly, all previously established null hypotheses can be rejected at the given significance levels in favor of their corresponding H_1 Hypotheses.

Table 3

Ranking of the 50 largest German insurance groups regarding compliance with the taxonomy regulation

Insurance Group	Legal Form	Ranking 2021	Ranking 2022
"Allianz"	Stock	*A*	*A*
"R+V"	Stock	*C*	*C*
"Generali"	Stock	*C*	*A*
"ERGO"	Stock	*A*	*A*
"Debeka"	Mutual	*E*	*B*
"AXA"	Stock	*D*	*C*
"Talanx"	Mutual	*A*	*A*
"HUK Coburg"	Mutual	*C*	*A*
"SIGNAL IDUNA"	Mutual	*E*	*N/A*
"ALTE LEIPZIGER – HALLESCHE"	Mutual	*C*	*C*
"W&W"	Stock	*C*	*D*
"Gothaer"	Mutual	*D*	*D*
"Continentale"	Mutual	*C*	*C*
"LVM"	Mutual	*C*	*B*
"Nürnberger"	Stock	*D*	*C*
"VHV"	Mutual	*C*	*B*
"Viridium"	Stock	*D*	*D*
"HanseMerkur"	Mutual	*B*	*B*
"DEVK"	Mutual	*D*	*C*
"Barmenia"	Mutual	*B*	*A*
"VOLKSWOHL BUND"	Mutual	*B*	*B*
"ARAG"	Stock	*D*	*C*
"WWK"	Mutual	*B*	*B*
"Basler"	Stock	*E*	*E*
"Schweizerische Rentenanstalt/Swiss Life"	Stock	*D*	*D*
"Helvetia"	Stock	*E*	*D*
"INTER"	Mutual	*E*	*E*
"SDK"	Mutual	*E*	*D*

Insurance Group	Legal Form	Ranking 2021	Ranking 2022
"Concordia"	Mutual	*C*	*C*
"Universa"	Mutual	*E*	*E*
"WGV"	Mutual	*C*	*C*
"Stuttgarter"	Mutual	*E*	*E*
"Münchener Verein"	Mutual	*D*	*E*
"ADAC"	Stock	*C*	*N/A*
"Die Bayerische"	Mutual	*D*	*D*
"Itzehoer"	Mutual	*D*	*D*
"Mecklenburgische"	Mutual	*D*	*D*
"RheinLand"	Stock	*E*	*E*
"IDEAL"	Mutual	*E*	*N/A*
"VPV"	Mutual	*D*	*D*
"Wertgarantie"	Stock	*E*	*D*
"Verti"	Stock	*D*	*B*
"VK Bayern"	Public Law	*C*	*D*
"Provinzial"	Public Law	*C*	*B*
"SV"	Public Law	*C*	*C*
"VGH"	Public Law	*A*	*A*
"SV Sachsen"	Public Law	*A*	*A*
"Öffentliche Braunschweig"	Public Law	*D*	*D*
"ÖRAG"	Public Law	*D*	*D*
"BGV"	Public Law	*D*	*D*

Table 4

Estimation results for the regression specified in (1)

Variable	Logit Specification	Probit Specification
Size	0.6922*** (0.1691)	0.3934*** (0.0946)
VVAG	0.6772** (0.4049)	0.3621* (0.2317)
Off*R*	1.3828*** (0.5075)	0.7913*** (0.2900)
MR	0.6140** (0.3478)	0.3488** (0.1984)
Audit	0.6162* (0.4090)	0.3351* (0.2357)
FY	0.4748* (0.3148)	0.2811* (0.1797)
γ_1	–8.688*** (1.4704)	–4.9708*** (0.7997)
γ_2	–8.428*** (1.4324)	–4.7695*** (0.7766)
γ_3	–7.1101*** (1.3462)	–4.0652*** (0.7409)
γ_4	–5.1638*** (1.2328)	–2.9176*** (0.6921)

*, **, *** Indicate the one-tailed statistical significance of the coefficient estimates at the 10 percent, 5 percent, and 1 percent levels, respectively

A clear correlation can be observed between the size of the insurance group and the degree of compliance with the taxonomy regulation. In order of magnitude for the Logit Specification, the change in the probabilities for achieving the next rank increases with a change in premiums of 1% c.p. in around 0.6922%.

It is also evident that public law insurance groups (Off*R*) are comparatively more compliant with the requirements of the Taxonomy Regulation. This is either due to the influence of public stakeholders, who are particularly interested in high-quality taxonomy reporting, or it could also be due to estimation uncertainty due to the small number of public law groups (total of 8, see Table 3).

The location of the non-financial statement within the management report in itself contributes to an average improvement in compliance with disclosure requirements. It can therefore be assumed that information in the management

report is prepared with a greater awareness of the requirements of the regulation than in a separate non-financial report. In the future, as a result of the amendments of the CSRD, it can thus be expected that the quality of sustainability reporting will already be improved and greater care will be taken solely by including it in the management report.

Table 5 presents the correlations of the explanatory variables. Three of them are prominent in terms of their magnitude and implication.

1. Large insurance groups tend to be more inclined to locate their non-financial reporting in the management report.

2. Large insurance groups are more inclined to have their non-financial reporting audited by an independent auditor. This circumstance also aligns with previous research concerning voluntary audits such as Hay and Davis (2004) and Dedman et al. (2014).

3. mutual insurance companies do not tend to have their non-financial reporting audited.

Table 5

Correlation of explanatory variables

	Size	VVAG	Off*R*	*MR*	*Audit*	*FY*
Size	1					
VVAG	–0.0969	1				
Off*R*	–0.1027	–0.4584	1			
MR	0.2959	–0.02171	–0.1936	1		
Audit	0.4435	–0.3288	–0.01644	0.02067	1	
FY	0.01162	–0.0093	0.01375	0.02171	0.06558	1

The Table is displaying Pearson correlation coefficients

Although limited assurance testing has a measurable impact on the level of compliance, this impact is not significant at a level of at least 5%. Considering the correlations in Table 5, the added value of testing may not be adequately measured. For large groups, which are predestined by their size alone to comply with the disclosure requirements with a high probability, an audit of the disclosures leads to a relatively low added value. Smaller insurance groups that are exposed to a higher risk of non-compliance could benefit more from an audit of the completeness and accuracy of the sustainability-related disclosures.

The effect of the subsequent year is relatively small compared to the effects of the other dummy variables and is also not significant at a significance level of at

least 5%. Consequently, improvements in reporting due to learning effects have only emerged to a lesser extent.

5. Summary

Insurance companies do not contribute directly to the advance of climate change through the scope of their operations in a scale comparative to industrial undertakings. Nevertheless, they can play an important role in the transformation to a sustainable economy (Recital 27 CSRD). They can contribute directly and indirectly to the environmental objective of adaptation to climate change as defined in Art. 9 (2) of the Taxonomy Regulation.

The direct contribution consists in their insurance activities in the non-life business by providing financial compensation for damages arising in connection with climate change or by providing financial compensation for events that harm the environment. The indirect contribution being insurance companies can make a significant contribution to financing the implementation of sustainable economic activities.

This paper has shown that at the end of the transitional adaption period, mainly but not exclusively smaller insurance groups will have to catch up and make increased efforts to comply with the upcoming comprehensive sustainability reporting under the CSRD and ESRS in addition to the Taxonomy Regulation.

Furthermore, we found that, due to a lack of specificity in the legal provisions, there are differences in interpretation which mean that the key figures provided with regard to underwriting and, in particular, investments due to lack of data. These are comparable with each other only under strict conditions. This does not yet take into account the fact that additional differences in interpretation will most likely arise when applying the alignment criteria. Nevertheless, according to a proposal of the EU Commission (Annex 5 of C(2023) 3851 final), the classification of non-life businesses into taxonomy-eligible and non-taxonomy-eligible remains relevant. This is already the case with regard to investments. It would therefore be important for a uniform procedure to be established in the insurance market for the classification of taxonomy-compliant underwriting activities in order to ensure comparability for the recipients of the reporting.

The paper also supports the assumption that the changes implemented by the CSRD to the Accounting Directive can be expected to improve the quality of sustainability reporting (formerly non-financial reporting). These changes relate to the inclusion of information in the management report and an audit requirement for the disclosures presented.

Building on the findings from the analysis conducted, future research might include an investigation if the results found, hold true for taxonomy aligned reporting being located in the non financial statement for the last and only time and being integrated into the management report from 2024 onwards.

Related fields of research in the context of non-life insurers might include an investigation into the offer of sustainable designed insurance products to new business. In the area of life insurance, this question could be transferred to the offer of sustainable insurance investment products in accordance with Art. 8 & 9 SFDR and if policyholders would pay an extra premium for green investments. About the taxonomy-aligned insurance business, it may be worth investigating whether a progressive interpretation in the taxonomy-eligibility criteria also results in a comparatively high taxonomy-compliant indicator. This could be associated with an increased risk of greenwashing which is considered a particular risk by the national supervisory authority, as the supervisory review of SFRD disclosure requirements by auditors must be oriented on the risk of greenwashing (IDW 2023b).

References

Chekima, B./*Wafa*, S. K./*Wafa*, S. A./*Igau*, O. A./*Chekima*, S./*Sondoh*, S. L. (2016): Examining green consumerism motivational drivers: does premium price and demographics matter to green purchasing?. In: Journal of Cleaner Production, 112, pp. 3436–3450. DOI: 10.1016/j.jclepro.2015.09.102.

Dedman, E./*Kausar*, A./*Lennox*, C. (2014): The Demand for Audit in Private Firms: Recent Large-Sample Evidence from the UK. In: European Accounting Review, 23(1), pp. 1–23. DOI: 10.1080/09638180.2013.776298.

Dhaliwal, D. S./Radhakrishnan, S./*Tsang*, A./*Yang*, Y. G. (2012): Nonfinancial Disclosure and Analyst Forecast Accuracy: International Evidence on Corporate Social Responsibility Disclosure. In: The Accounting Review, 87(3), pp. 723–759. DOI: 10.2308/accr-10218.

Drozdenko, R./*Jensen*, M./*Coelho*, D. (2011): Pricing of Green Products: Premiums Paid, Consumer Characteristics and Incentives. In: International Journal of Business, Marketing, and Decision Sciences, 4(1), 106–116.

European Commission (12/11/2019): The European Green deal. Available online at: https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_19_6691/IP_19_6691_EN.pdf, checked on 6/24/2023.

European Commission (2022): Commission Notice on the interpretation of certain legal provisions of the Disclosures Delegated Act under Article 8 of EU Taxonomy Regulation on the reporting of eligible economic activities and assets. In: Official Journal of the European Union, 65(C 385), pp. 1–19. Available online at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C:2022:385:FULL, checked on 8/9/2023.

Freudenreich, B./*Lüdeke-Freund*, F./*Schaltegger*, S. (2020): A Stakeholder Theory Perspective on Business Models: Value Creation for Sustainability. In: J Bus Ethics, 166(1), pp. 3–18. DOI: 10.1007/s10551-019-04112-z.

Frias-Aceituno, J. V./*Rodriguez-Ariza*, L./*Garcia-Sanchez*, I. M. (2013): The Role of the Board in the Dissemination of Integrated Corporate Social Reporting. In: Corp. Soc. Responsib. Environ. Mgmt., 20(4), pp. 219–233. DOI: 10.1002/csr.1294.

Gatzert, N./*Reichel*, P./*Zitzmann*, A. (2020): Sustainability risks & opportunities in the insurance industry. In: ZVersWiss, 109(5), pp. 311–331. DOI: 10.1007/s12297-020-00482-w.

Gerwanski, J./*Kordsachia*, O./*Velte*, P. (2019): Determinants of materiality disclosure quality in integrated reporting: Empirical evidence from an international setting. In: Bus Strat Env, 28(5), pp. 750–770. DOI: 10.1002/bse.2278.

Hay, D./*Davis*, D. (2004): The Voluntary Choice of an Auditor of Any Level of Quality. In: AUDITING: A Journal of Practice & Theory, 23(2), pp. 37–53. DOI: 10.2308/aud.2004.23.2.37.

IDW (2023a): Besonderheiten bei der Berichterstattung nach Art. 8 der Taxonomie-Verordnung. Fragen und Antworten (Teil 2). Edited by Institut der Wirtschaftsprüfer, checked on 8/4/2023.

IDW (2023b): IDW Praxishinweis 1/2023. Edited by IDW Verlag GmBH. Available online at https://shop.idw-verlag.de/media/eb/g0/d0/1680692244/IDW_%20PH_1_2023_20230330.pdf, checked on 8/3/2023.

KIVI GmbH: Marktanteilsstatisik. Die Marktanteile der Anbieter auf dem deutschen Erstversicherungsmarkt im Jahr 2021 und im Zeitvergleich der Jahre 2014 bis 2021 (2021).

Lee, K.-H. (2017): Does Size Matter? Evaluating Corporate Environmental Disclosure in the Australian Mining and Metal Industry: A Combined Approach of Quantity and Quality Measurement. In: Business Strategy and the Environment, 26(2), pp. 209–223.

Long, J. S. (2011): Regression models for categorical and limited dependent variables. Thousand Oaks, Calif.: Sage Publ (Advanced quantitative techniques in the social sciences, 7).

MacAskill, S./*Roca*, E./*Liu*, B./*Stewart*, R. A./*Sahin*, O. (2021): Is there a green premium in the green bond market? Systematic literature review revealing premium determinants. In: Journal of Cleaner Production, 280, p. 124491. DOI: 10.1016/j.jclepro.2020.124491.

McCullagh, P./*Nelder*, J. A. (1999): Generalized linear models. 2. ed., [Nachdr.]. London: Chapman & Hall (Monographs on statistics and applied probability, 37).

Miller, B. P. (2010): The Effects of Reporting Complexity on Small and Large Investor Trading. In: The Accounting Review, 85(6), pp. 2107–2143. DOI: 10.2308/accr.00000001.

Miralles-Quirós, M./*Miralles-Quirós*, J./*Redondo Hernández*, J. (2019): ESG Performance and Shareholder Value Creation in the Banking Industry: International Differences. In: Sustainability, 11(5), p. 1404. DOI: 10.3390/su11051404.

Rinaldi, L./*Unerman*, J./*Villiers*, Ch. de (2018): Evaluating the integrated reporting journey: insights, gaps and agendas for future research. In: AAAJ, 31(5), pp. 1294–1318. DOI: 10.1108/AAAJ-04-2018-3446.

Schuh, F./*Noth*, L. M. (2022): Ownership structures and risk taking in the German property-liability insurance market. In: Journal of Co-operative Organization and Management 10 (1), p. 100165. DOI: 10.1016/j.jcom.2022.100165.

Shen, H./*Wu*, H./*Chand*, P. (2017): The impact of corporate social responsibility assurance on investor decisions: Chinese evidence. In: Int J Audit, 21(3), pp. 271–287. DOI: 10.1111/ijau.12094.

Veltri, S./*Cristiano*, E./*Ferraro*, O. (2023): Examining the quality of the consolidated mandatory non-financial statements of a cooperative banking group: A longitudinal analysis. In: Corp Soc Resp Env Ma, 30(4), pp. 1573–1587. DOI: 10.1002/csr.2436.

Vitolla, F./*Raimo*, N./*Rubino*, M./*Garzoni*, A. (2019): How pressure from stakeholders affects integrated reporting quality. In: Corp Soc Resp Env Ma. DOI: 10.1002/csr.1850.