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The stock market's reaction to first-time assured sustainability reporting

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Abstract

This study examines the relationship between the publication of first-time assured sustainability reporting and the stock market's reaction, and whether this relationship differs based on the number of previously published sustainability reporting. This study tests two hypotheses formulated from prior research on sustainability reporting. To test the hypotheses, this study uses a sample of Dutch listed companies for the period 2012-2024. The results of a fixed effects panel regression model indicate that the publication of first-time assured sustainability reporting has no association with the market-adjusted cumulative abnormal stock returns. Additional fixed effects panel regression model analysis suggests that, for companies publishing sustainability reporting that is assured for the first time, the number of previously published sustainability reporting is not associated with the stock market's reaction. Lastly, this study has multiple implications.

Keywords market-adjusted cumulative abnormal stock returns, first-time assurance, stock market's reaction, sustainability reporting

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1. Introduction

Sustainability reporting is undergoing a massive change, like a river dramatically transforming after a heavy rainstorm. Where previously this river had a steady flow, it is now creating new paths through the landscape. This transformation is reshaping the entire ecosystem. For sustainability reporting, the starting point is not a heavy rainstorm, but the introduction of the Corporate Sustainability Reporting Directive (CSRD) on January 5, 2023 (European Commission, 2023).

The CSRD mandates companies to disclose information about their environmental, social and governance (ESG) activities on a regular basis. Companies have to report about the risks and opportunities they see with regard to their ESG activities and what impact their activities can have on others. Moreover, they are required to receive assurance on their sustainability reporting. This must be obtained from an independent third party (European Commission, 2023).

The CSRD becomes effective in fiscal year 2024. However, not all companies will have to apply the new rules immediately. Initially, only large European companies with over 500 employees must comply. From fiscal year 2025 onwards, an increasing number of companies will have to apply the new rules (Lalonde, 2024).

1.1. Research question

In 2022, 90% of the 100 largest Dutch companies reported on their sustainability activities. However, only 57% of the 100 largest Dutch companies were seeking assurance on sustainability reporting (KPMG International, 2022). This implies that the remaining 43% must start seeking assurance if they qualify under the CSRD. This could lead to a significant number of first-time assured sustainability reporting in the upcoming years.

Therefore, this study focuses on the possible consequences of the publication of first-time assured sustainability reporting for companies that are listed on the Dutch market for the period 2012-2024. Investigating how investors are reacting to the publication of first-time assured sustainability reporting will give useful insight in possible stock market's reactions to first-time assured sustainability reporting publications as a result of the introduction of the CSRD.

There are two objectives in this study. First, this study aims to determine whether the publication of first-time assured sustainability reporting has an effect on the stock market's reaction. This leads to the main research question of this study.

What is the effect of sustainability reporting that is assured for the first time on the stock market's reaction?

The second objective is to determine if the number of previously published sustainability reporting before the publication of first-time assured sustainability reporting changes the effect between the publication of first-time assured sustainability reporting and the stock market's reaction.

1.2. Social relevance

This study has two main social contributions. First, this study aims to contribute to the understanding of shareholders' reactions to the publication of first-time assured sustainability reporting. Understanding this reaction benefits both investors and companies that do not (yet) need to comply with the CSRD. Investors could benefit from this study as it provides insight in whether to invest in companies that publish first-time assured sustainability reporting. Moreover, this study could also benefit companies by providing insight into the effects of such publications, potentially influencing their decision to seek assurance.

Second, this study aims to enhance understanding of shareholders' reactions to the publication of first-time assured sustainability reporting, while considering the number of previously published non-assured sustainability reporting. Understanding this reaction benefits both investors and companies that do not (yet) need to comply with the CSRD. This study could benefit investors by providing insight into another factor that might influence their decision to invest in companies publishing first-time assured sustainability reporting. Additionally, companies could also benefit from this study as it provides insight into the effect of previously published non-assured sustainability reporting, which could alter their decision to seek assurance.

1.3. Scientific relevance

This study also has various scientific contributions. First, this study contributes to the confirmation of the existing literature and theories by using different settings and contexts. This is achieved by using a different sample, timeframe, and dependent variable. Second, this study contributes to the further explanation of the existing literature and theories as different studies have found different relationships. Lastly, this study contributes to the extension of the existing literature and theories. This is achieved by studying the effects of first-time assured sustainability and the number of previously published non-assured sustainability reporting. The scientific relevance will be discussed in more detail in the contribution subsection of the literature review.

1.4. Structure

This paper follows a chronological order of presentation. The second section discusses the concepts that are of relevance in this study. It also discusses the literature on sustainability reporting. Based on prior findings, the third section develops the hypotheses. The fourth section presents the research methodology including a description of the sample and variables. The fifth section shows the results. The sixth, and last, section provides the implications and limitations.

2. Conceptual development and theoretical framework

Sustainability reporting is the disclosure of ESG information of a company. A company can disclose about their sustainability activities via an integrated report, incorporated in the financial report or as a standalone sustainability report (Baumüller & Sopp, 2021; Krasodomska et al., 2021). Within this study, all three forms of reporting are included and regarded as sustainability reporting. The reason of including these three forms, is that the CSRD does not differentiate between these three forms of reporting (European Commission, 2023).

Moreover, together with the mandated reporting of sustainability information, the CSRD also requires companies to receive assurance on their sustainability reporting (European Commission, 2023). The assurance on sustainability reporting defines as ensuring that information provided about sustainability activities is in compliance with their sustainability activities. In other words, to ensure that their actions align with their claims (Christensen et al., 2021). The CSRD mandates that assurance on the sustainability reporting of companies should be received by independent third parties, such as accounting firms or other independent assurance providers (European Commission, 2023). Since the CSRD does not disclose who must give the assurance, within this study, there will be no differentiation between the different assurance providers. The CSRD initially mandates companies to receive limited assurance¹, but with reasonable assurance² expected at a later date (Tsang et al., 2023). As a result, no differentiation will be made in this study with regard to the type of assurance received.

The research performed in this study investigates the relationship between the publication of first-time assured sustainability reporting and the stock market's reaction. A stock

¹ Limited assurance is a level of assurance in which the assurer is not aware of any notable adjustments that should be made (Tsang et al., 2023).

² Reasonable assurance is a level of assurance in which there is a minimal probability that material misstatements will not be prevented or identified promptly (Tsang et al., 2023).

market reaction is a sudden shift in a stock's price, either upward or downward (Sorescu et al., 2017). This is often the result of (the announcement of) an event. This can be the publication of a report by the firm itself or other new information about a firm that has become public by other entities (Grewal et al., 2020). The event of this research is the publication of first-time assured sustainability reporting. Firm value and market value are two concepts that are closely related to stock market reaction (Sorescu et al., 2017). Therefore, for the remainder of this study, these concepts are considered equivalent. Furthermore, there are multiple variables available to measure the stock market's reaction. Examples are the stock prices synchronicity³ and Tobin's Q⁴ (Du et al., 2017; Grewal et al., 2020; Loannou and Serafeim, 2019). The stock prices synchronicity and Tobin's Q will not be further explained in this literature review as these are not the main focus of the research performed in this study.

This research uses namely the market-adjusted cumulative abnormal stock returns (CASRs) as measure of the stock market's reaction. The CASRs is the cumulated difference between the actual return of a company and the expected return based on the market return (Du et al., 2017; Wang and Li, 2015). In the research methodology section there will be further explanation of the concept and how it is calculated in this research.

In recent years, a growing number of studies have been done on all sort of effects arising from the publication and quality of sustainability reporting. Nevertheless, it is still a relatively new and fast-changing research field in which new research, especially empirical research, can still be done. This literature review first focuses on empirical studies about the effect of sustainability reporting on the stock market's reaction after which empirical studies about the effect of assurance are discussed.

2.1. Sustainability reporting and the stock market's reaction

Du et al. (2017) found that there is a significant positive stock market's reaction to the publication of sustainability reporting. To find this result, they used the CASRs as measurement of the stock market's reaction. They found this result both for the short and long term. Their sample consisted of American companies for the period 2005-2011. For the short term, the positive effect of a publication was stronger for companies that were active within a weak information environment. No such effect was found in the long term (Du et al., 2017). These results, also with a sample consisting of American companies, are consistent with the research

³ The measure of stock prices synchronicity extracts the portion of stock price movement that is specific to the firm and not driven by either market or industry returns (Grewal et al., 2020).

⁴ Tobin's Q is calculated by dividing the market value of a company with the replacement cost of its assets' (Loannou and Serafeim, 2019).

performed by Matsumura et al. (2013). However, there are some differences in how they came to the same results.

Where Du et al. (2017) focused on full sustainability reporting, Matsumura et al. (2013) only focused on the disclosure of carbon emissions. Moreover, as measurement of the stock market's reaction, they used the number of shares outstanding multiplied by the price per share at year-end. Furthermore, they used a shorter timeframe as they only used data of carbon emissions for 2006 to 2008. They found that firms that do disclose about their carbon emissions had a higher firm value when comparing with firms that did not disclose about their carbon emissions (Matsumura et al., 2013).

On the other hand, Grewal et al. (2020) came to the conclusion based on their results that the publication of sustainability reporting had no significant effect on the stock market's reaction. To find this result, they used stock prices synchronicity as measurement of the stock market's reaction. However, they also used an American sample, but used a more recent time period compared to the studies discussed before as they looked at ESG disclosure from 2007 to 2015 (Grewal et al., 2020).

To summarize, even though Du et al. (2017) and Matsumura et al. (2013) suggest that there is a positive effect of sustainability reporting on the stock market's reaction, it is not clear-cut. This, because Grewal et al. (2020) found with their more recent study that there is no such effect. However, these studies had American companies as sample. The analysis that will follow hereafter focuses on studies where the sample consisted of companies from around the world.

Loannou and Serafeim (2019) studied a sample of companies listed in China, Denmark, Malaysia and South Africa for the period 2005-2012. The reason for these countries was that in these countries there were already some mandatory regulations concerning the disclosure of ESG information. As estimation for the firm value, Loannou and Serafeim made use of Tobin's Q. Their results showed that sustainability reporting mandated by regulations had a positive association with firm valuation (Loannou and Serafeim, 2019).

Wang and Li (2015) investigated a smaller sample compared to Loannou and Serafeim (2019) as they only studied companies listed in China for the period 2007-2012. Moreover, they only took into consideration the publication of sustainability reports that were standalone for the first-time and used the CASRs as evaluation of market value. However, despite the different setting, the results obtained gave the same insights as Loannou and Serafeim (2019). They also found that this effect was stronger for companies owned by private shareholders compared to companies owned by central and local government (Wang and Li, 2015).

When studying a sample of Taiwanese companies between 2010-2016, Liou et al. (2023) found that voluntary sustainability reporting is significantly positively associated with the stock market's reaction (Tobin's Q). This result is consistent with the findings of Loannou and

Serafeim (2019) and Wang and Li (2015). However, Liou et al. (2023) also found that mandatory publication of sustainability reporting has no association with Tobin's Q. This result is more in line with the finding of Grewal et al. (2020). Even though they used different measurements for the stock market's reaction, they found the same result. Moreover, both these studies used a relatively newer timeframe when compared to the other studies that have been discussed so far.

Another study that found contrasting results with their research were Abdelqader et al. (2024). They studied an international sample consisting of companies from all over the world. Moreover, the sample included observations between 2013 and 2021. To estimate the firm value, they also used the frequently used Tobin's Q. Their results were two-sided. First, companies that had implemented the cost leadership strategy enjoyed a positive association between sustainability reporting and their firm value. Second however, companies who had implemented the differentiation strategy saw a negative association between sustainability reporting and their firm value (Abdelqader et al., 2024). It is for the first time that a negative association has been found, while the researches mentioned before found either a positive association or no association.

A negative association between sustainability reporting and firm value like Abdelqader et al. (2024) had found, had also been found by Nguyen (2020). He found that when companies published sustainability reporting in compliance with the Global Reporting Initiative (GRI) guidance⁵, firm value decreased. To find this result, Nguyen (2020) studied a sample of German companies from 2013 to 2017. Furthermore, as estimation of the firm value he used the share price at year end and four months after year end.

To conclude, all studies discussed used different samples with regard to both the companies selected as well as the time period. Moreover, there were also differences in which measurement of the stock market's reaction were used. The country in which a company is listed does not seem to matter with regard to the relationship between the publication of sustainability reporting and the stock market's reaction. This seems to be the case, as studies using companies from the same country or countries have found contrasting results. Additionally, these contrasting results were found for almost all countries over the world. The same can be said about the measurement of the stock market's reaction as the same contrasting results were found for the measurements discussed. However, when looking at the different timeframes, there seems to be a pattern. Studies that used a relatively older timeframe, mostly found a positive relationship. On the other hand, studies that used a relatively more recent timeframe, mostly found either a negative relationship or no relationship.

⁵ GRI guidance is a guidance for sustainability reporting that companies can voluntarily comply with (Nguyen, 2020).

2.2. The effect of assurance

The second part of this literature review focuses on the effect of the publication of assured sustainability reporting on the stock market's reaction. The added criterium is that sustainability reporting must be assured by an independent third party.

Most of the studies which performed a research on a sample of companies from all over the world found a positive association between assured sustainability reporting and the stock market's reaction (Elbardan et al., 2023; Friske et al., 2022; Kuzey et al., 2023; Uyar et al., 2021). To find this result, they all used Tobin's Q as measurement of the stock market's reaction. However, the difference between these studies is mostly visible in the time period used. Elbardan et al. (2023) used data for the period 2004-2019. Uyar et al. (2021) used almost the same time period with observations from between 2005 and 2019. Kuzey et al. (2023) used a relatively smaller time period with data from between 2007 and 2018. Friske et al. (2022) used the most recent time period with observations for the period 2011-2020. It is notable that all studies used a timeframe which is in line with the studies discussed in the previous subsection that found either a negative or no relationship.

Clarkson et al. (2019) found that it was not always the case that there is a relationship between the publication of assured sustainability reporting and the stock market's reaction. They found that only when the assurance was performed by a Big 4 accounting firm there was a positive relationship. When this was not the case, no relationship was found. They found this result with the same sample as the studies mentioned before. However, Clarkson et al. (2019) used the total market value of equity as indication of the stock market's reaction. Additionally, they used observations from between 2009 and 2015. This timeframe is a slightly older timeframe than the studies mentioned before.

Like Clarkson et al. (2019), Abdelqader et al. (2024) also found contrasting results. As mentioned before, they moderated for firm strategy and used Tobin's Q for the stock market's reaction and used a sample consisting of companies from all around the world for the period 2013-2021. Their results, again, were two-sided. First, firms employing the cost leadership strategy experienced a positive relationship between assured sustainability reporting and their firm value. Second however, just as with unassured sustainability reporting, firms employing the differentiation strategy experienced a negative relationship between assured sustainability reporting and their firm value (Abdelqader et al., 2024).

To summarize, most of studies discussed found that there is a positive relationship between the publication of assured sustainability reporting and the stock market's reaction. These studies all had a worldwide sample. However, there were some specific cases in which there was no such relationship or even a negative relationship. It seems like that this could be the effect of the different measurements of the stock market's reaction as these were different

across the studies. The timeframes were mostly the same and do not seem to have an influence on the effect studied. The next part discusses studies which samples that focussed on companies listed in a specific country rather than all over the world.

Both Nguyen (2020) and Thompson et al. (2022) found a positive association between the publication of assured sustainability reporting and the stock market's reaction. Where Nguyen (2020) studied a German sample, Thompson et al. (2022) found their result with a sample consisting of companies based in South Africa. As discussed before, Nguyen (2020) used the share price at year end and four months after year end as the firm value. On the other hand, Thompson et al. (2022) used Tobin's Q to more align their study with other research. Furthermore, the sample of Thompson et al. (2022) included data from the period 2015-2019, while Nguyen (2020) used a slightly older time period with observations from between 2013 and 2017.

Contrary to the previous two discussed studies, no such relationship was found by Fazzini and Maso (2016). They found this result on a sample of companies listed in Italy. For these companies they looked at observations from between 2008 and 2013. Furthermore, they used the market capitalization divided by the book value of equity as indication of the firm value (Fazzini and Maso, 2016).

To conclude, the studies that used a more recent timeframe mostly found a positive relationship between the publication of assured sustainability reporting and the stock market's reaction. On the other hand, studies that used an older time period found more diverse relationships. This is in contrast with the conclusion of previous subsection where the positive relationship was mostly found by studies who used a less recent timeframe and more diverse relationships were found by studies using newer time periods. Additionally, the country in which a company is listed does seem to be of influence on the relationship. This can be deduced from the fact that where Nguyen (2020) and Thompson et al. (2022) found a positive relationship for companies in respectively in Germany and South Africa, while Fazzini and Maso (2016) found that there was no such relationship for companies listed in Italy. Lastly, the different measurements of the stock market's reaction does not seem to be of influence on the relationship as different result were obtained while using the same measurement.

The conclusion helps with identifying the research gaps of the existing literature. First, as far as the researcher knows, there have been few studies that included companies listed on the Dutch market into their sample and no studies were found who solely focussed on companies listed on the Dutch market with regard to both non-assured and assured sustainability reporting and the effect of its publication on the stock market's reaction. Additionally, most studies used a timeframe of before 2020. Given the fast-changing environment in which sustainability reporting finds itself, these studies could become outdated relatively quickly. Moreover, limited studies are found that used the CASRs as measurement

of the stock market's reaction. Furthermore, the studies who used the CASRs did not consider the assurance of sustainability reporting. Lastly, to the best of the researcher's knowledge, no studies have been found that examine the effect of publishing sustainability reporting, which was assured for the first time, on the stock market's reaction.

2.3. Contributions

This subsection states the contributions of the empirical research that will be executed in this study. These contributions are based on the identified research gaps discussed within the literature review. Where the introduction focusses on the practical (social) contribution, this subsection lays the focus on the theoretical and methodological contribution.

Firstly, this empirical research contributes to the confirmation of the existing literature and theories by using different settings and contexts. As far as the researcher's knows, there are limited studies that studied the effect of the publication of both non-assured and assured sustainability reporting on the stock market's reaction with a sample of companies listed in the Netherlands. The research performed in this study focuses solely on companies listed on the Dutch market. Moreover, the world of sustainability reporting is fast-changing and the existing studies get outdated relatively quick. Hence, this research contributes by studying a newer time period to control for these changes. Furthermore, To the best of researcher's knowledge, there are few studies that used the CASRs as measurement of the stock market reaction as most studies used the Tobin's Q. This study contributes to the existing literature by using the CASRs as measurement of the stock market reaction.

Secondly, this empirical research contributes to the further explanation of the existing literature and theories. According to the conclusion of the literature review, studies have identified different relationships with both the same and different samples. Studies found positive, negative and no relationships between the publication of both assured and non-assured sustainability reporting and the stock market's reaction. These contrasting relationships also existed when comparing studies with more recent timeframes to studies with older time periods. Lastly, the same contrasting relationships can be deduced when comparing the different measurements of the stock market's reaction. The research performed in this study aims to enhance the understanding of this relationship, especially since current findings are inconsistent.

Lastly, this empirical research contributes to the extension of the existing literature and theories. As far as the researcher's knows, there have been no studies that studied the effect of the publication of first-time assured sustainability reporting on the stock market's reaction. Therefore, this study investigates the effect of publishing sustainability reporting, that is assured for the first time, on the stock market's reaction. Furthermore, this research accounts

for the effect of the number of non-assured sustainability reporting publications prior to the publication of first-time assured sustainability reporting.

3. Hypotheses development

3.1. Publishing first-time assured sustainability reporting

The literature provides contradicting findings for the relationship between the publication of assured sustainability reporting and the stock market's reaction. Abdelqader et al. (2024) found cases where there was a negative relationship and Clarkson et al. (2019) and Fazzini and Maso (2016) found that there was no relationship. However, most studies have shown that there is solely a positive association between assured sustainability reporting and the firm value (Elbardan et al., 2023; Friske et al., 2022; Kuzey et al., 2023; Nguyen, 2020; Thompson et al., 2022; Uyar et al., 2021).

The different measurements of the stock market's reaction do not seem to affect the direction of the relationship. However, the country in which the company is listed does seem to affect the direction of the relationship. Nguyen (2020) found a positive association for German listed companies, while Fazzini and Maso (2016) found no association for Italian listed companies. The Netherlands are generally considered comparable to Germany, which is why you would expect the same relationship for companies listed on the Dutch market as found by Nguyen (2020). Moreover, the studies that found a positive association between assured sustainability reporting and the stock market's reaction mostly used a more recent time period than the studies that found either no association or a negative association. Based on the above research, first-time assured sustainability reporting may increase the firm value.

H1: The market valuation of a company increases when it first implements assured sustainability reporting.

3.2. The number of previously published sustainability reporting

Also without considering the assurance in the relationship between the publication of sustainability reporting and the stock market's reaction, the findings in the literature are contradictory. Most studies found a positive relationship between sustainability reporting and the stock market's reaction (Du et al., 2017; Liou et al., 2023; Loannou and Serafeim, 2019; Matsumura et al., 2013; Wang and Li, 2015). However, Grewal et al. (2020) found no such association and Abdelqader et al. (2024) and Nguyen (2020) even found a negative association.

Both the country in which a company is listed and the difference in measurement of the stock market's reaction do not seem to affect the direction of this effect. On the other hand, the time period of the sample does seem to affect the direction of this association. Most studies who found a positive effect used a relatively older timeframe compared to the studies who found either no effect or a negative effect. This could indicate that investors react negatively to the fact that companies have only recently started to publish sustainability reporting. Hence, first-time assured sustainability reporting should have a stronger positive association with the stock market's reaction when the number of years a company has previously published sustainability reporting is higher.

H2: Investors will react more strongly the more years companies have previously reported on sustainability.

4. Research methodology

4.1. Sample description

The sample of this research consists of companies listed on the Amsterdam Exchange Index (AEX) and the Amsterdam Midkap Index (AMX). Together, these indexes contain 50 companies. During the period from between 2012 and 2024, 31 of these companies published sustainability reporting that was assured for the first time. However, 3 companies received first-time assurance on their sustainability reporting before they were listed on the Dutch Market. Hence, these are excluded from the 31 companies. The remaining 28 companies are regarded as the treatment group, while the other 22 companies are regarded as the control group.

Data for this research is available from the LSEG⁶ Workspace Database. However, not all data is available. To identify whether a company published first-time assured sustainability reporting and the publication date of this publication, the company websites (newsroom or investors relations section), the financial reports and the sustainability reports are searched. For companies that did not publish assured sustainability reporting or had already received assurance before 2012, this research uses the publication date of the financial report for the fiscal year 2021. This specific year is chosen because most companies began receiving assurance on their sustainability reporting for the fiscal year 2021. This approach helps control for certain influences not included in the model.

⁶ London Stock Exchange Group

4.2. Research methods

A potential problem when investigating the relationship between the publication of first-time assured sustainability reporting and the performance of a firm is the endogeneity of sustainability reporting. The relationship between the performance of a firm and the publication of first-time assured sustainability reporting could work in both directions. For instance, firms who performed strongly decide to receive assurance on their sustainability reporting, suggesting that the initial strong performance influences market valuation, rather than the assurance on sustainability reporting (Wang & Li, 2015). To examine the impact of assurance of sustainability reporting on the stock market's reaction, this research uses one of the most direct approaches to test for causal relationships, namely event-study methodology (Campbell et al., 1998; Morck & Yeung, 2011).

This event study uses the publication of first-time assured sustainability reporting as the event date. This research investigates the incremental effect of first-time assurance on top of sustainability reporting. Companies who report about their sustainability activities, publish their sustainability reporting on the same day as their financial report. Hence, as an event for the control group this research uses the publication date of the financial report.

As a measurement of the stock market's reaction this research uses the CASRs. To calculate the CASRs, this research uses the market model for company i over event window $[t_1, t_2]$ surrounding the publication date. According to the market model ($R_{i,t} = \alpha_i + \beta_i R_{M,t}$), the only factor that influences the return on the stock of a company i , at time t , is the return on the market at time t (Brown & Warner, 1985). The first part of this research uses multiple event windows to calculate the CASRs. The second part of this research, which involves a fixed effects panel regression model, only uses a five-day event window $(-2, 2)$. The CASRs of a company over the event window are calculated as follows:

$$CASR_i = \sum_{t=t_1}^{t_2} [R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{M,t})], \quad (1)$$

where $\hat{\alpha}_i$ and $\hat{\beta}_i$ are estimated with the market model. The parameters of the market model can be estimated via ordinary least squares regression. This research uses an eighty-day window $(-100, -21)$ to calculate the parameters. The variable $R_{M,t}$ is the market return at time t . The variable $R_{i,t}$ is the observed return of company i at time t . After estimating the expected return for each company, the daily abnormal stock returns (DASRs) are estimated. To estimate the DASRs, as in Eq. 1, this research takes the difference between the observed and expected returns for company i at each point in time t over the event window $[t_1, t_2]$. Lastly, to estimate the CASRs, the DASRs for company i over the event window are summed (Wang & Li, 2015).

The first part of this research differentiates between two categories of companies. The first group consists of companies that published first-time assured sustainability reporting. The second group consists of companies that did not publish first-time assured sustainability reporting within the time period or were not listed on the Dutch market at the moment of publishing.

However, even though the event-study methodology is a strong method to find a causal relationship, it fails to control for other variables that may cause a stock market reaction. Hence, the second part of this research uses a fixed effects panel regression model to control for these other variables. For the first hypothesis, this research wants to investigate if the publication of sustainability reporting, that is assured for the first time, has a positive effect on the stock market's reaction. The fixed effects panel regression model is as follows:

$$\begin{aligned}
 CASR_{i,j,t} = & \beta_0 + \beta_1 Assurance_FT_{i,t} + \beta_2 ROA_{i,t-1} + \beta_3 Size_{i,t-1} + \beta_4 BTM_{i,t-1} + \\
 & \beta_5 Leverage_{i,t-1} + \beta_6 PYS_reporting_{i,t} + \beta_7 Sales\ growth_{i,t-1} + \\
 & \beta_8 ESG_{i,t-1} + \beta_{10} Loss_{i,t-1} + \delta_j + \varepsilon_{i,j,t},
 \end{aligned} \tag{2}$$

where $CASR_{i,t}$ is the CASRs (expressed as a percentage) for company i for the event window $[t_1, t_2]$ in year t ; $Assurance_FT_{i,t}$ is the main independent variable equal to 1 if a company publishes sustainability reporting that is assured for the first time in year t (treatment group), and 0 otherwise (control group); and $PYS_reporting_{i,t}$ is the number of years a company has previously published sustainability reporting. The subscripts for all variables, i , j and t , refer to the company, the industry and the fiscal year, respectively. This research also controls for other factors that may affect the stock market's reaction, but these are discussed in the next subsection.

The second hypothesis predicts that investors will react more strongly the more years companies have reported on sustainability in preceding years. To test H2, this research adds the interaction term between $Assurance_FT_{i,t}$ and $PYS_reporting_{i,t}$ to Eq. 3. The model is specified as follows:

$$\begin{aligned}
 CASR_{i,j,t} = & \beta_0 + \beta_1 Assurance_FT_{i,t} + \beta_2 PYS_reporting_{i,t} + \\
 & \beta_3 Assurance_FT_{i,t} \times PYS_reporting_{i,t} + \beta_4 ROA_{i,t-1} + \beta_5 Size_{i,t-1} + \\
 & \beta_6 BTM_{i,t-1} + \beta_7 Leverage_{i,t-1} + \beta_8 Sales\ growth_{i,t-1} + \beta_9 ESG_{i,t-1} + \\
 & \beta_{10} Loss_{i,t-1} + \delta_j + \varepsilon_{i,j,t},
 \end{aligned} \tag{3}$$

where all variables are the same as in Eq. 2 and either already explained before or explained in the next subsection. The coefficients $(\beta_1 + \beta_3)$ represent the causal relationship between the publication of first-time assured sustainability reporting and the stock market's reaction while accounting for the number of years companies reported on sustainability in preceding years. The relationship between the publication of first-time assured sustainability reporting and the

stock market's reaction when a company did not report on sustainability in preceding years is represented by β_1 . If β_3 is positive, it indicates that the stock market's reaction to the publication of sustainability reporting that is assured for the first time is stronger for companies that have published sustainability reporting in more previous years, thereby supporting H2.

4.3. Control variables and descriptive statistics

This subsection explains the variables used in our fixed effects panel regression models, except for $CASR_{i,t}$, $Assurance_FT_{i,t}$ and $PYs_reporting_{i,t}$, which were already explained in the previous subsection. First, ROA , which stands for return on assets (ROA), is computed by dividing earnings before interest and tax (EBIT) by the average total assets (expressed as a percentage) (Wang & Li, 2015). ROA is included, because Beaver (1968) found that ROA may contain useful insights for investor. $Size$, which stands for the firm size, is expressed as the natural logarithm of the total assets, which is similar to research of Nguyen (2020). Fama and French (1993) identified that the book-to-market value of equity can affect the stock market's reaction. Hence, BTM is included and computed as the book value of equity divided by the market value of equity at the year-end (Wang & Li, 2015). As in the research of Friske et al. (2022), $Leverage$ is computed by dividing total liabilities by total assets (expressed as a percentage). Following Martin et al. (2018) and Bommaraju et al. (2018), this model includes $Sales\ growth$ as sales growth over the prior three years (expressed as a percentage). Furthermore, this research controls for the sustainability performance by including an ESG-score. ESG is the combined score of the individual scores for ESG performance. These individual scores are given by the LSEG Workspace Database themselves. The inclusion of an ESG-score is similar to Du et al. (2017). Lastly, a dummy variable $Loss$ is included. This dummy variable is equal to 1 if the company made a loss (EBIT) in year $t-1$ and 0 otherwise. Table 1 contains descriptive statistics of the variables.

To add to these variables, this research also controls for potential industry (δ_j) fixed effects. Moreover, $\varepsilon_{i,j,t}$ is an error term. Additionally, the calendar year is typically used as the fiscal year for companies listed on the Dutch market. This means that in year t , the financial reports for fiscal year $t-1$ are released. To account for this, this research uses the information reported in financial report $t-1$ (Wang and li, 2015). Lastly, the models can be affected by heteroskedasticity and autocorrelation. Therefore, this research uses robust standard errors to account for these issues.

Table 1

Descriptive statistics

Variable	Mean	SD	Min	Max
CASR(-2, 2)	0.39	5.74	-9.04	23.42
Assured_FT	0.56	0.50	0	1
PYs_reporting	5.40	6.19	0	21
ROA	7.33	8.99	-9.97	33.47
Size	23.17	1.78	19.08	27.60
BTM	1.98	5.21	-6.94	33.39
Leverage	45.97	27.68	1.01	156.65
Sales growth	12.26	29.92	-38.32	168.46
ESG	58.35	13.37	30.23	86.56
Loss	0.14	0.35	0	1

Note. Table 1 reports the descriptive statistics for the sample of 50 observations. *SD* represents the standard deviation. Variables are defined in section 4.

5. Results

5.1. Results for H1

H1 predicts that the market valuation of a company increases when it first implements assured sustainability reporting. Table 2 presents the CASRs for various event windows and samples around the publication dates of sustainability reporting and the financial report. There is no significant stock market's reaction for any event window at a five percent significance level. Moreover, there is no significant stock market's reaction when differentiating between the treatment and control groups.

Table 2

Mean stock market's reactions

Variable	Group CASRs		
	Total	Treatment	Control
CASR(-7, 7)	1.463 (1.234)	1.175 (1.323)	1.831 (2.282)
CASR(-4, 4)	1.029 (1.054)	0.146 (1.069)	2.154 (1.979)
CASR(-3, 3)	1.029 (0.894)	0.431 (0.958)	1.791 (1.641)
CASR(-2, 2)	0.394 (0.819)	-0.362 (0.781)	1.357 (1.573)
CASR(-1, 1)	0.026 (0.793)	-0.606 (0.847)	0.830 (1.450)

Note. Table 2 reports the mean CASRs in percentages for the different event windows and samples. The treatment group consists of companies that published first-time assured sustainability reporting between 2012 and 2024 and were listed on the Dutch market at the time. Robust standard errors are in parentheses.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

However, the results from Table 2 do not control for other variables that may influence the stock market's reaction. Hence, in Model 2 and 4 of Table 3 control variables are added that may cause the stock market's reaction to change. Furthermore, in Model 3 and 4 the industry fixed effects are added. All models use the CASR(-2, 2) as dependent variable. Model 1 presents the same result as the difference between the treatment and control groups for the five-day event window in Table 2. Model 4 of Table 3 is the model that represents Eq. 2. Therefore, this is the model of interest. Model 4 presents, at a five percent significance level, no statistically significant coefficient for the publication of first-time assured sustainability reporting (*Assured_FT*). In the other models, *Assured_FT* is also not statistically significant .

In general, the publication of first-time assured sustainability reporting is not associated with the CASRs. This finding does not support H1. Moreover, among all control variables, only the coefficient for sales growth in Model 2 is statistically significant at a five percent significance level. Finally, Model 4 explains little of the variance in the stock market's reaction as indicated by the relatively low R² statistic (R² = 0.279).

Table 3
Fixed effects panel regression model

Variable	[1]	[2]	[3]	[4]
Assured_FT	-1.719 (1.753)	-4.180 (2.661)	-1.535 (1.954)	-4.163 (2.820)
ROA		0.048 (0.131)		0.050 (0.146)
Size		-0.876 (0.776)		-0.942 (0.926)
BTM		0.060 (0.157)		0.097 (0.153)
Leverage		-0.052 (0.033)		-0.061 (0.039)
PYs_reporting		-0.297 (0.240)		-0.353 (0.279)
Sales growth		-0.039** (0.019)		-0.038* (0.020)
ESG		0.025 (0.064)		0.031 (0.068)
Loss		0.287 (2.979)		-0.327 (3.510)
Constant	1.357	25.493	1.871	27.360
Industry fixed effects	No	No	Yes	Yes
R ²	0.022	0.248	0.058	0.279
N	50	50	50	50

Note. Table 3 reports the CASR(-2, 2) in percentages resulting from the publication of first-time assured sustainability reporting, along with control variables (Eq. 2). Variables are defined in section 4. Robust standard errors are in parentheses.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

5.2. Fixed effects panel regression model for H2

H2 predicts that investors will react more strongly the more years companies have previously reported on sustainability. Table 4 presents the fixed effects panel regression model with CASR(-2, 2) as dependent variable. Model 2 and 4 include the control variables, while Model 3 and 4 include the industry fixed effects. Model 4 is the model that represents Eq. 3 and therefore the model of interest. According to this model, the coefficient for the interaction term *Assured_FT* x *PYs_reporting* is not statistically significant at a five percent significance level. Furthermore, *Assured_FT* is not statistically significant at a five percent significance level. The other models show the same results of no statistically significance.

In general, the association between the publication of first-time assured sustainability reporting and the CASRs does not differ when there is a difference in the number of previously published sustainability reporting. Therefore, H2 is not supported. Moreover, of all control variables, only the coefficient for sales growth in Model 2 is statistically significant at a five percent significance level. Finally, Model 4 explains little of the variance in the stock market's reaction as indicated by the relatively low R^2 statistic ($R^2 = 0.291$).

Table 4

Fixed effects panel regression model (accounting for the number of previously published sustainability reporting)

Variable	[1]	[2]	[3]	[4]
Assured_FT	-5.806* (3.217)	-5.506* (3.216)	-5.309 (3.313)	-5.429 (3.315)
PYs_reporting	-0.396* (0.219)	-0.374 (0.270)	-0.421* (0.242)	-0.431 (0.312)
Assured_FT x PYs_reporting	0.616* (0.333)	0.336 (0.319)	0.548 (0.359)	0.328 (0.351)
ROA		0.026 (0.130)		0.027 (0.146)
Size		-0.786 (0.810)		-0.821 (0.984)
BTM		0.050 (0.161)		-0.088 (0.155)
Leverage		-0.047 (0.033)		-0.055 (0.039)

Sales growth		-0.039** (0.019)		-0.038* (0.020)
ESG		0.028 (0.064)		0.031 (0.068)
Loss		-0.262 (3.183)		-0.996 (3.772)
Constant	4.846	23.948	5.338	25.256
Industry fixed effects	No	No	Yes	Yes
R ²	0.138	0.261	0.171	0.291
N	50	50	50	50

Note. Table 4 reports the CASR(-2, 2) in percentages resulting from the publication of first-time assured sustainability reporting, accounting for the number of years companies have previously reported on sustainability, along with control variables (Eq. 3). Variables are defined in section 4. Robust standard errors are in parentheses.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

6. Discussion

6.1. Conclusion and implications

This study investigates how first-time assured sustainability reporting influences the stock market's reaction, as measured by the CASRs. This study tests hypotheses developed from previous research on sustainability reporting, while using a sample of Dutch listed companies for the period 2012-2024. H1 predicts that the market valuation of a company increases when it first implements assured sustainability reporting. The results of the analysis in this study indicate that, in general, the publication of first-time assured sustainability reporting is not associated with the stock market's reaction.

H2 predicts that investors will react more strongly the more years companies have previously reported on sustainability. The results of the analysis in this study indicate that, for companies that publish sustainability reporting that is assured for the first time, the number of previously published sustainability reporting is generally not associated with the stock market's reaction. In other words, investors do not react more weakly or strongly the more years companies have previously reported on sustainability.

The findings of this study have multiple theoretical implications. First, the finding with regard to the first hypothesis of this study is similar to Fazzini and Maso (2016), who found that there is no association between the publication of assured sustainability reporting and the stock market's reaction. The difference in research is that the research of this study only investigated first-time assured sustainability reporting. Moreover, this research studied companies listed on

the Dutch market, whereas Fazzini and Maso (2016) studied a sample of Italian listed companies.

However, besides Fazzini and Maso (2016), the finding of this study is not aligning with other previous research. The results in this study run counter to most expectations in the marketing literature as most studies found mostly a positive association between the publication of assured sustainability reporting and the stock market's reaction.

Furthermore, this study also finds new results as no previous studies investigated the effect of first-time assurance. Lastly, there were no studies that found comparable results with regard to the second hypothesis. The reason is that no study were found that investigated the relationship between the number of previously sustainability reporting and the stock market's reaction for companies who published first-time assured sustainability reporting.

The findings of this study have also multiple practical implications. First, the results of this study imply that companies neither benefit nor suffer detriment from receiving first-time assurance on sustainability reporting.

This finding is also beneficial in light of the CSRD that took effect on January 5, 2023. The reason this is beneficial, is because the CSRD requires companies to receive assurance on their sustainability reporting (European Commission, 2023). For companies this could mean that they need to receive assurance on their sustainability reporting for the first time. The results of this study imply that it is not effective for investors to speculate on the effect of this as there is no association between first-time assured sustainability reporting and the stock market's reaction. Additionally, the results of this study imply that for companies not requiring assurance in the near future, it is not effective to consider the firm value effect of first-time assured sustainability reporting.

Finally, when taking into account the number of previously published sustainability reporting, the results of this study imply the same implications as the practical implications stated above. Namely, for companies that publish sustainability reporting that is assured for the first time, there is no association between the number of previously published sustainability reporting and the stock market's reaction.

6.2. Limitations and future research directions

Although this study makes multiple contributions to theory and practice, it has limitations. First, this study only takes into consideration voluntarily assurance, because no company listed on the Dutch market is mandatory to receive assurance on their sustainability reporting. The results may differ when companies are required to receive assurance, which will apply to more companies starting in the fiscal year 2024 (European Commission, 2023).

Moreover, this study has limitations with regard to its data. Firstly, the sample only consists of 50 companies of which 28 are regarded as treatment group. This could lead to a significant influence of outliers. However, after examining the data, there don't appear to be any significant outliers in the sample. However, the small sample could also be the problem of not finding a significant effect, which was expected based on the previous studies on the sustainability reporting. Hence, it is preferable to have a larger sample. Secondly, the data gathered from the LSEG Workspace Database is questionable. Comparing the collected data with data from financial reports reveals some contrasting information. For consistency, this study exclusively used data from the LSEG Workspace Database. However, there are three variables that are gathered from external sources as the LSEG Workspace Database does not contain this data. These variables are *Assurance_FT*, *PYs_reporting* and the publication dates of sustainability reporting and financial reports. Third, not all preferred control variables have been included in the analysis as the LSEG Workspace Database did either not have the data or had incomplete data. As not every (un)observable variable is included, the zero conditional mean assumption does not hold.

Lastly, the findings of this research and conclusion of this study may only be relevant to markets that are comparable to the Dutch market. This is important, because no variables are included to account for the difference between countries in which a company is listed. The country in which a company is listed can have significant influences on the effects studied. For example, some cultures require more sustainability activities than others. Therefore, caution is required when generalizing the findings of this study.

There are multiple possible future research directions. First, future research can examine the effect of mandatory first-time assured sustainability reporting on the stock market's reaction. As the CSRD mandates that an increasing number of companies receive assurance on their sustainability reporting, this could lead to insightful findings. Additionally, future research can examine the effect of first-time assured sustainability reporting on the stock market's reaction for a more wider sample to enrich the generalizability of the results. Moreover, future research can moderate for the type of assurer, as Clarkson et al. (2019) found that only assurance received from a Big 4 accounting firm had a positive stock market reaction. Lastly, future research can use different dependent variables, like the Tobin's Q, because a different measure of the stock market's reaction could give different results.

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Appendix

Generative Artificial Intelligence

In the process of crafting this paper, Generative Artificial Intelligence (AI) played a crucial role. Primarily, ChatGPT was employed to rephrase written sentences, aiming to enhance the language quality of this paper and incorporate the advanced language capabilities of AI.

The results obtained from ChatGPT were useful, because it spots spelling errors and mistakes in word order. Moreover, it improves the quality of the paper as ChatGPT has a higher standard of the English literature and uses more advanced concepts. However, two issues appeared with the use of ChatGPT. First, ChatGPT employs American English instead of British English. Second, with the help of ChatGPT, the focus on spelling disappears as it will be corrected nevertheless.

Below is the full list of prompts used. For convenience reasons, every sentence for which the prompt "Is this sentence correct?" was used, are listed below each other. The **bold** text states the prompt, while the *italicized* text are the original sentences.

What is the opposite of benefit?

Is this sentence correct?

which is the same result as founded by Loannou and Serafeim (2019) and Wang and Li (2015).

Where Du et al. (2017) were focussing on the publication of sustainability reports, were Matsumura et al. (2013) only focussing on the disclosure of carbon emissions.

These results, while also studying a sample of American companies, have also been found with research of Matsumura et al. (2013).

According to these studies, one would expect this positive relationship to be clear-cut. However, this is not the case.

To conclude, like with samples consisting of companies based all over the world, research that had a more specific sample mostly found a positive relationship.

Before the existing literature is being discussed, it is important to define important concepts that plays a vital role during this research.

The market valuation of a company increases when there is first-time assured sustainability reporting.

Investors will react stronger when companies did not report on sustainability in previous years.

In this research it is the publication of assured reporting about sustainability.

Therefore, in this study it does not matter who gives the assurance.

According to the CSRD need assurance on sustainability reporting of companies to be performed by third parties like accounting companies or other independent assurance providers.

To find this result, they used a newer timeframe compared to the studies discussed before as they looked at ESG disclosure from 2007 to 2015.

Studies who did control for the assurance of sustainability reporting were not found using the cumulative stock market's reaction.

The different measurements of the stock market's reaction does not seem to matter for the direction of the relationship.

This could indicate that they react negatively to the fact that companies only in recent years start to publish sustainability reporting.

For the companies that did not publish assured sustainability reporting or already received assurance before 2012 we take the publication date of the financial report about fiscal year 2021.

Lastly, to calculate the CASR for every company, take the sum of every daily ASRs of a company within the event window.

Fama and French (1993) also found that companies who are in a phase of expansion, usually have a lower firm value.

Hence, first-time assured sustainability reporting should have a stronger positive association with the stock market's reaction when the number of sustainability reporting in the years before increases.

Investors will react more strongly the more times companies have reported on sustainability in prior years.

Table 1 contains descriptive statistics of the variables mentioned.

The table reports the fixed effects panel regression model results of the CASR(-4, 4) caused by the publication of first-time assured sustainability reporting along with control variables.

The treatment group consists of the companies that published first-time assured sustainability reporting during the period 2012-2024 and were also listed on the Dutch market at that date.

Model 1 presents the same result as the difference between the treatment group and control group for the five-day event window in table 2.

These findings are interesting with regard to the entered CSRD as of the first of January 2023.

Furthermore, the results of this paper imply that for companies not requiring assurance in the near future it is not worth it to consider the firm value effect of first-time assured sustainability reporting.

This could open the door to big influence of outliers.

Lastly, there needs to be caution when generalizing the findings to other countries.

As the CSRD mandates an increasing number of companies to receive assurance on their sustainability reporting, this could lead to insightful findings.

Sustainability reporting is changing massively, like a river undergoing a dramatic transformation after a heavy rainstorm.

This implies that the other 43% have to start seeking assurance if they qualify under the CSRD.

Understanding this reaction benefits both investors and companies not needing to apply to the CSRD.

This is done by using another sample, timeframe and dependent variable.

Bold states the prompt, while the Italic is the own written text.