Journal of
Risk and Financial Management

MDPI

Article

The Effects of CSR Report Mandatory Policy on Analyst Forecasts: Evidence from Taiwan

Tzu-Yun Tseng [1,*] and Nien-Su Shih [2]

[1] Department of Public Finance, University of Feng Chia, Taichung 40724, Taiwan
[2] Department of Accounting, University of Feng Chia, Taichung 40724, Taiwan; nsshih@fcu.edu.tw
* Correspondence: tytseng@fcu.edu.tw

Abstract: The Taiwanese government altered its corporate social responsibility (CSR) report management policy from voluntary disclosure and assurance of CSR reports to partial mandatory disclosure and partial mandatory assurance. This paper examines this policy's effects on analyst forecast. The empirical results showed that the mandatory disclosure policy on CSR reports significantly increased analyst forecast accuracy and reduced analyst forecast dispersion. Furthermore, the study found that analyst forecast accuracy was further increased when CSR reports were forced to undergo accountant assurance than those without mandatory accountant assurance which means that the mandatory assurance policy on CSR reports significantly further increased analyst forecast accuracy.

Keywords: corporate social responsibility reports; mandatory disclosure; mandatory assurance; analyst forecast accuracy; analyst forecast dispersion

check for updates

Citation: Tseng, Tzu-Yun, and Nien-Su Shih. 2022. The Effects of CSR Report Mandatory Policy on Analyst Forecasts: Evidence from Taiwan. *Journal of Risk and Financial Management* 15: 256. https://doi.org/10.3390/jrfm15060256

Academic Editor: Ştefan Cristian Gherghina

Received: 6 May 2022
Accepted: 2 June 2022
Published: 7 June 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Research Motivation and Purpose

The disclosure of financial reports by enterprises mainly allows investors to understand the business value of the enterprise through information in their financial statements. They also help businesses attract investment and obtain funds needed for enterprise development. However, the information on their past financial statements only reflects historical operating performance, which is inadequate in helping investors and stakeholders carry out better decision-making analysis. Recently, the rising awareness on environmental protection, corporate social responsibility (CSR), and sustainable management has attracted global attention. The methods on improving the transparency of corporate non-financial information disclosure and the means to provide investors with forward-looking information that exposes the economic resources and activities of enterprises, strengthens the accountability of enterprises, and integrates financial and non-financial information have become important issues for business operations.

The continuous expansion of the securities market in recent years has allowed the market to provide a vast amount of information on enterprises for investors to compare and judge; but not all market investors have sufficient time and ability to analyze the operation and financial status of each company. In this regard, analysts play the role of the company's information provider. Analysts have sufficient professional capabilities, information sources, and time advantage to provide investors with a more detailed and clear market and company information. They are also able to point out clear and sound investment recommendations for investors. Therefore, analysts act as a communication bridge between the company and the external investors. Investors often use the latest financial forecast reports provided by brokerage analysts as an important investment reference. Dhaliwal et al. (2014) found evidence that financial information and CSR disclosures can be substituted for each other to reduce the cost of equity capital. Lang and Lundholm (1996) pointed out that financial analysts play the role of key information intermediaries in capital markets. It is believed that when a company provides complete and transparent disclosure, it results in greater efficiency of information intermediaries, and

increased accuracy and reduced errors of financial analysts' forecasts (Lang and Lundholm 1996; Hope 2003).

At present, regarding the management of CSR reports, most countries adopt voluntary disclosure or voluntary assurance; therefore, the current literature is mostly based on voluntary disclosure or voluntary assurance. Some studies discussed the determinants of companies' voluntary disclosure of CSR (Alfraih and Almutawa 2017; Zhou 2019), the impact of voluntary disclosure of CSR on company value (Anderson and Frankle 1980; Al-Tuwaijri et al. 2004; Griffin and Sun 2013; Plumlee et al. 2015; Kamran et al. 2020), and the benefits of voluntary disclosure of CSR (Dhaliwal et al. 2011). Meanwhile, others focused on voluntary CSR report assurance; some explored the determinants of CSR report assurance (Simnett et al. 2009; Kolk and Perego 2010; Velte 2020), and the effects and benefits of voluntary assurance of CSR reports (Casey and Grenier 2015; Quick and Inwinkl 2020; Reverte 2020).

Past studies have well explored the relationship between disclosure of CSR and analyst forecasts. The study by Dhaliwal et al. (2012) used CSR reports as a proxy variable for non-financial disclosure information and found that companies that compiled CSR reports improved the analysts' earnings forecast accuracy. Further, Casey and Grenier (2015) found that CSR assurance is associated with lower cost of equity capital and lower analyst forecast errors and dispersion. However, the samples in the former provided CSR reports voluntarily, while those in the latter sought CSR report assurance voluntarily. The empirical results of these two studies may have endogenous doubts; that is, their samples are not perfect random samples, and the observed research results may have been produced by a self-selection mechanism, and were not entirely causal. Therefore, it is believed that there is still room for research on this issue.

Unlike most countries that adopt a voluntary CSR report policy, Taiwan's management policy on CSR reports ranges from voluntary disclosure and assurance to partial mandatory disclosure and assurance. The Financial Supervision and Management Commission (FSMC) of Taiwan issued the "Taiwan Stock Exchange (TWSE) Corporation Rules Governing the Preparation and Filing of Corporate Social Responsibility Reports by TWSE Listed Companies" in 2014. This stipulates that certain companies (listed under food, chemical, and financial and insurance industries, companies with 50% or more of their revenue derived from food and beverages, or those with a capital stock that is not less than TWD 10 billion) should refer to the Global Reporting Initiative's latest version of sustainability reporting guidelines, industry supplemental guidelines, and other applicable criteria based on industry characteristics when publishing their previous year's CSR report. In addition to the partial mandatory disclosure management policy for CSR reports, Taiwan's authority also proposed the partial mandatory assurance policy for CSR reports to improve their quality. This indicates that firms belonging to the food industry and those who derive not less than 50% of their revenue from food and beverages should further submit their reports to accountants for quality assurance (please see Appendix A for the complete regulations). Therefore, Taiwan's capital market is a suitable environment for CSR management policy research.

At present, most literature on CSR-related issues focuses on either voluntary disclosure or voluntary assurance. In this paper, Taiwan's partial mandatory disclosure and mandatory accountant assurance policies are explored using samples that were mandated to follow the said policies. In the context of voluntary CSR disclosure, Dhaliwal et al. (2012) found that CSR report disclosure improves the accuracy of analyst earnings forecasts. In the case of voluntary CSR assurance, Dhaliwal et al. (2012) found that CSR report disclosure improves the accuracy of analyst earnings forecasts. In the case of voluntary CSR assurance, Casey and Grenier (2015) found that CSR assurance is associated with lower analyst forecast errors and dispersion. In the absence of mandatory regulations on CSR reports, voluntary disclosure and voluntary assurance of CSR reports are both the result of a company's strategic choice. Unlike previous literature that discussed voluntary disclosure of CSR reports or voluntary assurance of CSR reports on analyst earnings forecasts separately, this study discusses the effects of both mandatory disclosure and mandatory assurance of

CSR reports on analyst earnings forecasts. The specific research questions of this paper are as follows: Can Taiwan's mandatory disclosure management policy on CSR reports improve the accuracy of analysts' forecasts (decrease the dispersion in analyst forecasts) on companies that are subject to mandatory disclosure of CSR reports? Can Taiwan's mandatory assurance management policy on CSR reports further improve the accuracy of analysts' forecasts (decrease the analyst forecast dispersion) on companies that are forced to take their CSR reports to an accountant for assurance?

This paper differs from current CSR-related studies that are based on voluntary disclosure or voluntary assurance that possibly have endogenous problems. This study contributes to the literature by enhancing the understanding on the effects of mandatory CSR disclosure and assurance policy on analyst forecasts in Taiwan, which has an emerging market setting, relatively weak corporate governance, and family-controlled business dominance. Previous literature has shown that corporate governance and country institution are determining factors for voluntary CSR disclosure (Alfraih and Almutawa 2017; Zhou 2019). It has been shown that compared with non-family businesses, family businesses have less incentive to provide CSR guarantees voluntarily (Peng 2020). It is therefore essential to determine whether it is necessary to regulate non-financial disclosure or assurance in a mandatory manner for countries with poor corporate governance or family-controlled businesses. In this regard, Taiwan's experience can be used as a reference for other countries—especially for emerging markets with relatively weak corporate governance mechanisms or family-controlled business dominance—when formulating corporate social responsibility reporting management legislation.

The remainder of the paper proceeds as follows: Section 2 reviews the literature and offers several testable hypotheses; Section 3 discusses the research sample and research models; Section 4 analyzes the statistical results of the main analysis; and Section 5 provides the conclusion of this study.

2. Literature Review and Research Hypothesis Construction

2.1. CSR Report Disclosure and Analyst Forecast

In financial markets, analysts are crucial information intermediaries (Livnat and Zhang 2012). Traditional financial statements may not be enough to demonstrate the company's value fully; thus, analysts seek new financial metrics and other non-financial information to measure the company's worth (Sveiby 1997). Extensive disclosure helps financial analysts produce valuable new information, such as more precise forecasts and buy/sell recommendations, thereby increasing demand for their services (Healy and Palepu 2001).

Investors and the public in the capital market are gradually valuing CSR-related activities; thus, CSR information may become an essential factor that could affect the value of the company. The studies by Anderson and Frankle (1980) and Griffin and Sun (2013) found that the market responded positively to companies who voluntarily disclosed CSR-related information. This indicates that CSR disclosure has information connotations. Moreover, Al-Tuwaijri et al. (2004) and Plumlee et al. (2015) found that companies that expose environment-related information have higher corporate value after controlling financial performance. As a whole, CSR-related activities can affect the company's value and financial performance by allowing investors to obtain some useful information from non-financial information disclosure as a reference for decision making. Hsu et al. (2019) suggest that investors and analysts consider CSR when assessing the information in earnings-related corporate disclosures.

Analysts mainly collect relevant information publicly or privately. The improvement of information transparency can reduce information asymmetry between companies and analysts, and can enable analysts to better understand a company's future prospects and changes in earnings, thereby improving the accuracy of earnings forecasts (Lang and Lundholm 1996) and promoting consensus among analysts on future earnings (Han and Manry 2000).

Several studies have explored the relationship between CSR disclosures and analysts. Dhaliwal et al. (2012) examined the relationship between disclosure of non-financial information and analyst forecast accuracy using firm-level data from 31 countries. They used the issuance of stand-alone CSR reports as a proxy for disclosure of non-financial information. They found that the issuance of stand-alone CSR reports is associated with lower analyst forecast error. Dhaliwal et al. (2011) found that CSR disclosure not only attracts more analysts and institutional investors, but also reduces analyst forecast errors, leading to lower costs of equity funds. This suggests that when analysts make earnings forecasts, they may use CSR reports as supplementary financial information to aid in forecast operations. Garrido-Miralles et al. (2016) investigated the effects of voluntary sustainability reporting in analysts' earnings forecasts as a driver for sustainable development. They provided evidence that there is a statistically significant negative association between the absolute forecast earnings error and the publication of a sustainability report. Nichols and Wieland (2009) found that analysts' forecasts revised to non-financial information become more accurate, and forecast error declines when companies issue non-financial disclosures. They suggested that non-financial disclosures improve the quality and quantity of information in capital markets and appear to enhance the value of analysts' services.

Overall, under the voluntary disclosure of CSR report setting, most previous studies agree that CSR reports revealing non-financial information activities may affect corporate value and that CSR information may be useful for analysts during the earnings forecast process. However, the scope of CSR is broad and has different aspects. Companies selectively disclose CSR information under a voluntary disclosure setting, and managers may issue non-financial disclosures for strategic purposes. Lu and Abeysekera (2021) found that the market positively reacts to strategic CSR disclosures, but the market fails to perceive whether such disclosures are credible. Hsu et al. (2019) pointed out that firms with adverse CSR performance exhibit lower disclosure quality and earnings persistence.

Companies may freely release relevant information based on strategic considerations by voluntary disclosure of CSR report setting. In contrast, mandatory CSR report disclosure is based on regulations. In Taiwan, companies mandated to disclose CSR reports shall prepare an annual corporate social responsibility report for the preceding year by referring to the Global Reporting Initiatives (GRI) Standards published by the GRI Sector Disclosure and other applicable rules according to its sector features. Moreover, these companies shall submit the CSR reports to the competent authority and announce their CSR reports on the same platform (the TWSE Corporation's Market Observation Post System). Hence, under the mandatory disclosure of CSR reports, the presentation of information will be more consistent, conducive to interpretation and comparison.

Therefore, this study suggests that the mandatory disclosure management policy on CSR reports can increase the quality and quantity of public information disclosure. This can help improve the accuracy of analyst forecasts for firms who are forced to disclose their CSR reports. Based on this, the following hypothesis is proposed:

Hypothesis 1a (H1a). *The mandatory disclosure management policy on CSR reports can improve the analysts' forecast accuracy.*

A single company may have many analysts paying attention to it. If analysts' forecasts differ greatly among each other, it indicates that there is great uncertainty in the corporate information environment (Imhoff and Lobo 1992; Payne and Robb 2000). A high uncertainty may make some analysts incapable of determining the truthfulness in the information, leading to a highly variable forecast result (Herrmann and Thomas 2005).

In an environment of voluntary disclosure, empirical research supports that non-financial information disclosure can reduce the dispersion of analysts' earnings forecasts (Lang and Lundholm 1996; Aerts et al. 2008; Nichols and Wieland 2009). However, under a voluntary disclosure setting, managers could issue non-financial disclosures for strategic

purposes, and such disclosures may lack credible information about the firm's future performance, hence increasing uncertainty about the firm's prospects.

The literature shows that the degree of analyst dispersion may also be affected by the quality of financial disclosures. For example, Swaminathan (1991) found that since the US Securities and Exchange Commission imposed several regulations on companies to disclose information, this indirectly improved the quality of corporate financial reports and reduced the degree of analyst dispersion. Mandatory CSR report disclosure is based on regulations. Preparing a CSR report must follow the GRI framework. Moreover, a CSR report should be announced on the same platform, i.e., the TWSE Corporation's Market Observation Post System. These measures allow analysts to obtain consistent information, resolving uncertainty about the firm's future prospects and consistent future earnings forecasts. This could lead to reduced analysts' forecast dispersion. In reference to this, the following hypothesis is proposed:

Hypothesis 1b (H1b). *The mandatory disclosure management policy on CSR reports can decrease the dispersion in analyst forecasts.*

2.2. CSR Report Assurance and Analyst Forecast

In order to improve the credibility of financial reports, independent agencies or organizations are now required to verify the appropriateness of their information. The same applies to independent CSR reports. In order to improve the credibility of the report, companies can use the services of a third-party independent organization to verify the integrity of information and reduce information asymmetry (Wallace 2004). Simnett and Nugent (2007) advocated that in order to increase stakeholder's trust in organizational commitments, the most important method is to seek third-party certification or assurance.

Assurance is the process of testing the credibility of a CSR report by a third-party unit to enhance the integrity and transparency of information and to improve the way information is collected. It builds the trust of stakeholders and increases the level of internal participation of the company by affirming the appropriateness and reliability of the information in the report.

The International Federation of Accountants (IFAC) with the assistance of the International Auditing and Assurance Standards Board (IAASB) issued the International Standard on Assurance Engagements 3000 (ISAE3000). It provides a general framework for assurance engagements and is used by third-party assurance providers as the standard for non-historical financial information. In Taiwan, the Standard on Assurance Engagements No. 1 was drafted based on the ISAE3000 and was implemented on 9 June 2015 by the ROC Accounting Research and Development Foundation. This shows that third-party assurance services are now emerging in Taiwan.

Internationally, assurance of CSR reports is still mainly voluntary. According to Simnett et al. (2009), a company's decision to deliver the sustainability reports and its choice of assurance provider depend on company, industry, and country-related factors. The empirical results of the study showed that companies seeking to enhance the credibility of their reports and build their corporate reputation are more likely to have their sustainability reports assured, although it does not matter whether the assurance provider comes from the auditing profession. Moreover, companies operating in a stakeholder-oriented country are more likely to choose the auditing profession as their assurance provider. Kolk and Perego (2010) considered national institutional factors and found that companies in a stakeholder-oriented country and that have weak governance mechanisms are more likely to deliver CSR report for assurance. Velte (2020) investigated the determinants and consequences of corporate social responsibility assurance and found that internal corporate governance, country-related governance, and specific financial determinants such as reporting, firm size, and industry sensitivity have a positive impact on CSR assurance adoption.

Based on the above literature, the determinants of a company's decision to have its CSR report undergo assurance are credibility, reputation, and country characteristics. It is

generally recognized that the credibility of information that has been confirmed or audited is far more reliable than that that has not been confirmed or audited (Libby 1979; Pany and Smith 1982; Hodge 2001). Credibility and reliability are important factors (Edgley et al. 2010), similar to how external audits provide higher credibility and reliability for financial statements (Simnett et al. 2009). An environmental report certified by a third party has higher disclosure quality than those without certification (Moroney et al. 2012). Furthermore, the certification of an environmental report enhances users' confidence in it (Hodge et al. 2009).

The assurance of a CSR report can not only increase credibility but can also bring other benefits. Casey and Grenier (2015) provided an empirical examination of the CSR assurance market in the United States. Their results showed that unlike their international counterparts, US finance and utilities firms are not likely (more than firms in other industries) to obtain CSR assurance despite facing significant social and environmental risks. As these industries are highly regulated in the United States, regulatory oversight may be acting as a substitute for CSR assurance. Moreover, CSR assurance is associated with lower cost of equity capital along with lower analyst forecast errors and dispersion. Furthermore, the reductions in cost-of-capital and forecast dispersion are significantly higher when an accounting firm performs the assurance. These results have implications for companies that are considering CSR assurance and accounting firms in developing and marketing their CSR assurance services. Reverte (2020) examined whether the European Directive 2014/95/UE in Spain would result in investors positively valuing the voluntary assurance of sustainability reports by listed companies from 2014 to 2017. The result showed that investors reward firms that adopt external sustainability assurance. Furthermore, they observed that investors value to a great extent those assurance statements with a broader scope, a high/reasonable level of assurance, and better quality. Stuart et al. (2020) found that investors viewed the management's willingness to obtain independent assurance on disclosures as a positive ethical signal; thus, assurance complements disclosure of CSR activities by adding protection against the impact of negative events.

Regrettably, the above research samples are from companies that voluntarily sought assurance. Their results may have been affected by self-selection bias factors. To prevent or lessen the external factors affecting the empirical results, the present study utilized random sampling and considered the special circumstances of Taiwan.

Based on the above literature, in addition to the role of a CSR report as a supplement to financial information, CSR report assurance can improve the quality of the report, increase its credibility, and improve the information environment. It can also help analysts in their forecasting operations. Therefore, we expect that compulsory compilation of CSR reports may increase the company's non-financial information and augment the transparency of information. In addition, it is believed that the mandatory assurance of CSR reports by an accountant could further improve the credibility of the reports and the company as well. Hence, the mandatory assurance policy can reduce analysts' forecast bias. Therefore, the following hypothesis is proposed:

Hypothesis 2a (H2a). *The mandatory assurance management policy on CSR reports can further improve the analyst forecast accuracy.*

Under the mandatory CSR assurance policy, the CSR report should obtain a confident opinion issued by an accountant to increase the quality of information disclosure. Therefore, we expect that the mandatory policy can reduce the dispersion of analysts' forecasts and propose the following hypothesis:

Hypothesis 2b (H2b). *The mandatory assurance management policy on CSR reports can further decrease the dispersion in analyst forecasts.*

3. Research Design

3.1. Research Sample

The purpose of this research is to explore the impact of partial mandatory disclosure and mandatory assurance policies on CSR reports since 2015 on analyst forecasts. For this study, data from both the pre- and post-mandatory disclosure management policies (from 2012 to 2019) were collected. The inclusion criteria were as follows: (1) the firm was subjected to mandatory disclosure by policy regulations; and (2) it has never disclosed any CSR reports before the mandatory disclosure policy. The purpose is to control the samples under the same CSR mandatory disclosure mechanism to avoid interference from other factors.

Since Taiwan's mandatory disclosure regulations on CSR reports were first implemented in 2014, the 2014 CSR reports were released in 2015. Therefore, all CSR reports submitted in 2014 were voluntary disclosures. This study used the CSR report disclosure data from the TWSE Corporation's Market Observation Post System to select the sample. This study compared the companies that issued CSR reports in 2015 with those that issued them in 2014 to select the samples that should disclose CSR reports in accordance with the CSR report mandatory disclosure regulations (101 companies). As the banking and insurance industry has a number of significant differences in terms of industrial characteristics and accounting systems, this study did not include 13 companies belonging to the banking and insurance industry. Finally, this study did not include 3 companies with incomplete data. After the sample selection process, a total of 85 companies were initially considered eligible. Data on analyst forecasts and variables on the 85 companies were then collected. In 2015, there were 874 listed companies on the TWSE. The sample of this study accounts for about 10% of the total listed companies. Table 1 shows the industry distribution of sample companies. Since not every company has analyst tracking and analyst forecasts every year, analyst earnings forecasts are a kind of irregular data. Finally, a total of 5349 analyst forecast data were utilized for empirical analysis. The sample data source was obtained from a database maintained by the Taiwan Economic Journal (TEJ), a leading credit analysis research agent. In this study, financial information and analyst forecast data were taken from the TEJ IFRS Finance database.

Table 1. Industry distribution of sample companies.

Industry	Number	Industry	Number	Industry	Number
Food	17	Rubber	1	Trade department store	1
Plastics	3	Electronics	9	Photoelectric	1
Textile	4	Semiconductors	3	Biotechnology and medical industry	1
Electrical cables	1	Building materials construction	4	Electronic channel	1
Chemical	21	Shipping	1	Other	11
Paper	2	Tourism	4	Total	85

3.2. Research Models and Variable Definitions

The first objective of this research is to explore the effects of Taiwan's mandatory disclosure management policy on CSR reports on analyst forecasts; that is, to determine whether the policy improved the accuracy of analyst forecasts (H1a) and decreased the dispersion in analyst forecasts (H1b) of companies mandated under said policy. To test H1a and H1b, we established Models (1) and (2), as follows:

$$\begin{aligned} AFA_{i,t} &= \beta_0 + \beta_1 CSRMD_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 STDROE_{i,t} + \beta_4 ROA_{i,t} \\ &+ \beta_5 STDEPS_{i,t} + \beta_6 LOSS_{i,t} + B_7 FOOD_{i,t} + B_8 CHEMICAL_{i,t} + \varepsilon_{i,t} \end{aligned}, \quad (1)$$

$$\begin{aligned} AFD_{i,t} &= \beta_0 + \beta_1 CSRMD_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 STDROE_{i,t} + \beta_4 ROA_{i,t} \\ &+ \beta_5 STDEPS_{i,t} + \beta_6 LOSS_{i,t} + B_7 FOOD_{i,t} + B_8 CHEMICAL_{i,t} + \varepsilon_{i,t} \end{aligned}, \quad (2)$$

where: AFA is analyst forecast accuracy. AFD is analyst forecast dispersion. CSRMD is CSR report mandatory disclosure policy. SIZE is firm size, STDROE is the standard deviation of return on equity, ROA is return on assets, STDEPS is the standard deviation of earnings per share, LOSS is firm loss dummy variable. FOOD is food industry dummy variable. CHEMICAL is chemical industry dummy variable. ε is an error term. i denotes firms (i = 1, 2, . . . , N), t denotes year (t = 1, 2, . . . , T).

The definitions of variables are as follows:

Analyst forecast accuracy (AFA): this study uses the following equation to measure AFA. Note that the (−1) indicates that the larger the AFA, the higher the accuracy of the analyst forecast.

$$AFA_{i,t} = (-1)\frac{\left|FORECAST_{i,t} - EPS_{i,t}\right|}{PRICE_{i,t-1}}$$

where: $FORECAST_{i,t}$ is the average number of the analysts' earnings per share (EPS) forecasts for each sample company in period t. $EPS_{i,t}$ is the actual earnings per share of each sample company in period t. $PRICE_{i,t-1}$ is the closing stock price of each sample company in period t−1.

Analyst forecast dispersion (AFD): AFD is defined as the standard deviation of earnings forecasts issued by individual analysts. AFD is usually regarded as a measure of uncertainty about future earnings, and it represents the degree of consistency of analysts' opinions on the company's future outlook (Barron and Stuerke 1998; Imhoff and Lobo 1992). It was calculated using the following equation. Note that AFD measures the degree of dispersion, and that the higher the AFD, the higher the degree of dispersion of analyst forecasts.

$$AFD_{i,t} = \frac{STD(FORECAST_{i,t})}{PRICE_{i,t-1}}$$

where: $STD(FORECAST_{i,t})$ is the standard deviation of the analysts' earnings per share (EPS) forecasts for each sample company in period t. $PRICE_{i,t-1}$ is the closing price at the end of the previous period.

CSR reports mandatory disclosure policy (CSRMD): the period before the implementation of a mandatory disclosure policy on CSR reports was set to 0 (i.e., 2012–2014), and the period after the issuance of the policy was set to 1 (i.e., 2015–2019).

Firm size (SIZE): measured by the logarithm of the company's total assets at the beginning of the period. In general, large-scale companies have a relatively high reputation and can easily attract investors' attention. Moreover, the potential benefits of investing in large companies are relatively large, making it easier to attract analysts (Atiase 1985; Hope 2003).

Standard deviation of return on equity (STDROE): measured using the firm's return on equity in the last 5 years. If a company's earnings volatility becomes relatively unstable in the long run, it will decrease the accuracy of analyst forecasts (Kross et al. 1990). This increases the cost of analysts' information collection and reduces their incentives, which in turn leads to increased analyst forecast errors and dispersion (Lang and Lundholm 1996).

Return on assets (ROA): the level of company profitability also affects analyst forecast accuracy (Eames and Glover 2003). In this study, it was measured by dividing the earnings before interest after tax by the total assets.

Standard deviation of earnings per share (STDEPS): measured by the standard deviation of earnings per share in the last 10 years. That is, the EPS data were collected from 2002 to 2019 to calculate the standard deviation of EPS in the past 10 years.

Firm loss dummy variable (LOSS): if a company is in a state of loss, earnings management may occur (Hayn 1995), affecting information transparency and the accuracy of analyst forecasts. Therefore, this study included a firm loss dummy variable as a control variable. If a company reported a loss in the current period, it was set to 1; otherwise, it was set to 0.

Food industry dummy variable (FOOD) and chemical industry dummy variable (CHEMICAL): Article 2 of Taiwan's policy entitled "Taiwan Stock Exchange (TWSE) Corporation Rules Governing the Preparation and Filing of Corporate Social Responsibility Reports by TWSE Listed Companies" stipulates the scope of listed companies that should prepare CSR reports. The first of these points out that at the end of the most recent fiscal year, companies belonging to the food industry, chemical industry, and financial and insurance industry should prepare a CSR report. Since financial and insurance companies are not within the scope of this research, the industry effects were controlled by adding two industry dummy variables, namely: FOOD for food industry which was set to 1, with the rest set to 0; and CHEMICAL for chemical industry which was also set to 1, with the rest set to 0.

The second objective of this research is to explore the effects of Taiwan's partial mandatory assurance management policy on CSR reports; that is, to determine whether this policy can further improve analyst forecast accuracy (H2a) and decrease analyst forecast dispersion (H2b) of companies mandated under this policy. To test H2a and H2b, we established Models (3) and (4), as follows:

$$\begin{aligned} AFA_{i,t} &= \beta_0 + \beta_1 CSRMD_{i,t} + \beta_2 CSRMD_{i,t} * CSRMA_{i,t} + \beta_3 CSRMA_{i,t} + \beta_4 SIZE_{i,t} + \\ &\beta_5 STDROE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 STDEPS_{i,t} + \beta_8 LOSS_{i,t} + \beta_9 FOOD_{i,t} + \beta_{10} CHEMICAL_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (3)$$

$$\begin{aligned} AFD_{i,t} &= \beta_0 + \beta_1 CSRMD_{i,t} + \beta_2 CSRMD_{i,t} * CSRMA_{i,t} + \beta_3 CSRMA_{i,t} + \beta_4 SIZE_{i,t} + \\ &\beta_5 STDROE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 STDEPS_{i,t} + \beta_8 LOSS_{i,t} + \beta_9 FOOD_{i,t} + \beta_{10} CHEMICAL_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (4)$$

CSRMA is CSR report mandatory assurance policy. It was set to 1 if the company mandatorily took its CSR report to the accountant for assurance; if not, it was set to 0. The remaining variables are the same as Model (1). In Model (3), if the coefficient of CSRMD is positive and the coefficient of CSRMD*CSRMA is also positive, it means that there is a further improvement in the analyst forecast accuracy of the company forced to have its CSR report undergo accountant assurance. In Model (4), if the coefficient of CSRMD is negative and the coefficient of CSRMD*CSRMA is also negative, it means that there was a further decrease in the analyst forecast dispersion of the company forced to have its CSR report undergo accountant assurance.

4. Empirical Results and Discussion

4.1. Descriptive Statistical Analysis

Table 2 provides the descriptive statistics of the research variables. Originally, there were 5349 individual analysts' earnings forecasts for the 85 sample companies. After the average earnings forecasts for each company were computed, a total of 402 entries of data were obtained.

The mean of AFA was −0.0423, which indicates that the difference between analyst forecast EPS and actual EPS accounted for an average of 4.23% of the initial stock price. The mean of AFD was 0.0225, which indicates that the average degree of dispersion accounted for 2.25% of the initial stock price. The SIZE was measured by the logarithm of the total assets at the beginning of the period; its mean was 7.5671. The mean of the variables related to profitability, such as ROE standard deviation (STDROE), ROA, EPS standard deviation (STDEPS), and reported loss (LOSS), were 5.5157, 5.3822, 1.4933, and 0.0896, respectively. Most of the observations in the sample were profitable and only 8.96% showed a loss.

Table 2. Descriptive statistics.

Variable	Mean	Maximum	Minimum	Standard Deviation
AFA	−0.0423	0	−1.13	0.09457
AFD	0.0225	0.95	0	0.05415
CSRMD	0.6617	1	0	0.47372
CSRMA	0.2438	1	0	0.42990
SIZE	7.5671	9.53	6.16	0.67399
STDROE	5.5157	32.72	0.16	5.27339
ROA	5.3822	44.26	−19.38	5.49512
STDEPS	1.4933	8.76	0.18	1.57472
LOSS	0.0896	1	0	0.28590
FOOD	0.2353	1	0	0.42449
CHEMICAL	0.2824	1	0	0.45048

Notes: AFA is analyst forecast accuracy. AFD is analyst forecast dispersion. CSRMD is CSR report mandatory disclosure policy dummy variable. CSRMA is CSR report mandatory assurance policy dummy variable. SIZE is firm size. STDROE is the standard deviation of return on equity. ROA is return on assets. STDEPS is the standard deviation of earnings per share. LOSS is firm loss dummy variable. FOOD is food industry dummy variable. CHEMICAL is chemical industry dummy variable. Observation number is 402.

The results of the correlation analysis are shown in Table 3. Multicollinearity in regression analysis is regarded as harmful only when correlations exceed 0.7 (Tabachnick and Fidell 2007). Here, the correlations between the independent variables included in the regression analysis were all less than 0.506. In addition, all variance inflation factor (VIF) values for independent variables employed in the regressions shown in Tables 3–5 were smaller than 1.99 and far lower than the critical value of 10 (Tabachnick and Fidell 2007), indicating that multicollinearity is negligible in the estimated equations.

Table 3. Pearson correlation analysis.

	CSRMD	CSRMA	SIZE	STDROE	ROA	STDEPS	LOSS	FOOD	CHEMICAL
CSRMD	1								
CSRMA	0.002	1							
SIZE	−0.036	−0.445 **	1						
STDROE	−0.016	−0.068	−0.035	1					
ROA	−0.062	0.187 **	−0.140 **	−0.015	1				
STDEPS	0.022	−0.045	0.150 **	0.497 **	0.122 *	1			
LOSS	−0.015	−0.097	−0.054	0.261 **	−0.506 **	0.106 *	1		
FOOD	0.000	0.677 ***	−0.229 ***	−0.066 *	0.038	−0.087 **	−0.02	1	
CHEMICAL	0.000	−0.348 ***	−0.057	−0.145 ***	0.048	−0.155 ***	−0.053	−0.348 ***	1

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

4.2. Empirical Results

The empirical results are shown in Table 4.

In Model (1), the CSRMD coefficient was positive with a 0.01 level of significance, indicating that analysts' earnings forecast accuracy increased when the mandatory disclosure policy was implemented. This shows that the policy improved the accuracy of earnings forecasts; therefore, H1a is supported. As for control variables, the values of firm size (SIZE), standard deviation of return on equity (STDROE), and firm loss (LOSS) were significantly negatively correlated with the analyst forecast accuracy (AFA). This means that firms with a bigger size, a higher standard deviation of return on equity, and an operating loss tend to decrease the analyst forecast accuracy. The chemical industry dummy variable (CHEMICAL) was significantly positively correlated with AFA which means that the analyst forecast accuracy for the chemical industry is higher than for other industries. The chemical industry is a highly polluting industry and is regulated by more regulations. Therefore, it provides more information, which is beneficial to analysts' predictions.

Table 4. Empirical results.

	Model (1)	Model (2)		Model (3)	Model (4)
	AFA	AFD		AFA	AFD
Variable	Coefficient	Coefficient	Variable	Coefficient	Coefficient
C	0.0038 (0.32)	−0.0491 *** (−7.53)	C	−0.0133 (−1.19)	−0.0314 *** (−4.51)
CSRMD	0.0109 *** (4.76)	−0.0033 ** (−2.48)	CSRMD	0.0076 *** (2.75)	−0.0045 ** (−2.49)
			CSRMD * CSRMA	0.0077 * (1.71)	−0.0032 (−1.23)
			CSRMA	0.0052 (1.22)	−0.0056 ** (−2.21)
SIZE	−0.0039 *** (2.66)	0.0083 *** (9.81)	SIZE	−0.0013 (−1.03)	0.0064 *** (7.58)
STDROE	−0.0018 *** (−4.04)	0.0007 *** (3.51)	STDROE	−0.0019 *** (−4.44)	0.0007 *** (3.43)
ROA	−0.00003 (−0.11)	0.0005 *** (3.14)	ROA	−0.0002 (−0.70)	0.0004 *** (3.16)
STDEPS	0.0025 ** (2.05)	−0.0004 (−0.61)	STDEPS	0.0024 ** (1.99)	−0.0003 (−0.46)
LOSS	−0.0461 *** (−5.97)	0.0051 * (1.71)	LOSS	−0.0462 *** (−6.08)	0.0046 (1.64)
FOOD	0.0008 (0.31)	−0.0035 ** (−2.34)	FOOD	−0.0054 * (−1.78)	0.00005 (0.02)
CHEMICAL	0.0051 ** (2.40)	−0.0052 *** (−3.86)	CHEMICAL	0.0078 *** (3.42)	−0.0077 *** (−4.86)
Adj-R^2	0.19	0.35	Adj-R^2	0.29	0.44
Obs.	402	402	Obs.	402	402
Firms	85	85	Firms	85	85

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

In Model (2), the CSRMD coefficient was negative with a 0.01 level of significance, indicating that the degree of dispersion of analyst earnings forecasts was reduced when the mandatory disclosure policy was implemented. This means that the policy decreased the dispersion of analyst earnings forecasts; therefore, H1b is supported. As for control variables, the values of firm size (SIZE), standard deviation of return on equity (STDROE), return on assets (ROA), and firm loss (LOSS) were significantly positively correlated with the analyst forecast dispersion (AFD). Both industrial dummy variables (FOOD, CHENICAL) were significantly negatively correlated with AFD which means that the analyst forecast dispersions for the two industries are lower than for other industries. The two industries are regulated by more regulations, so more information is provided, which is conducive to the consistency of analysts' forecasts and reduces the degree of dispersion of forecasts.

In Model (3), the coefficient of CSRMD was positive and significant, indicating that analysts' earnings forecast accuracy increased when the mandatory disclosure policy was implemented. The coefficient of CSRMD*CSRMA was also positive and significant, indicating that the compulsory accountant assurance policy further improved analysts' forecast accuracy. H2a is supported. In addition, the CSRMA coefficient was also positive, indicating that the mandatory assurance management policy on CSR reports increased the analyst earnings forecast accuracy. It implies that accountant assurance increased the credibility of CSR reports which helped analysts make predictions and improve the accuracy of earnings forecasts. However, the result of the CSRMA coefficient was not significant.

Table 5. Empirical results—further analysis.

	Model (5)	Model (6)		Model (7)	Model (8)
	AFA	AFD		AFA	AFD
Variable	Coefficient	Coefficient	Variable	Coefficient	Coefficient
C	0.0024 (0.04)	−0.0441 *** (−7.35)	C	−0.0336 (−1.27)	0.0022 (0.17)
CSRMD	0.0100 (0.59)	−0.0027 (−0.84)	CSRMD	0.0076 ** (2.07)	−0.0090 *** (−4.05)
CSRMD*MDG	0.0086 * (1.45)	−0.0009 * (−1.56)	CSRMD * CSRMB	0.0107 ** (2.00)	0.00003 (0.00)
MDG	0.0047 (0.29)	−0.0014 (−0.47)	CSRMB	0.0070 (1.28)	−0.0095 *** (−3.16)
SIZE	−0.0066 (−1.02)	0.0080 *** (11.04)	SIZE	0.0019 (0.59)	0.0023 (1.40)
STDROE	−0.0019 ** (−2.49)	0.0007 *** (4.47)	STDROE	−0.0025 *** (−3.99)	0.0007 ** (2.39)
ROA	0.0004 (0.54)	0.0002 (1.47)	ROA	−0.0010 *** (−3.04)	0.0006 *** (2.79)
STDEPS	0.0011 (1.59)	−0.0002 (−1.58)	STDEPS	0.0019 (1.38)	0.0006 (0.87)
LOSS	−0.0853 *** (−5.37)	0.0122 *** (4.09)	LOSS	−0.0381 *** (−5.60)	0.0059 (1.44)
FOOD	0.0034 (0.28)	−0.0025 (−1.58)	FOOD	−0.00007 (−0.01)	−0.0011 (−0.64)
CHEMICAL	0.0072 (0.65)	−0.0039 *** (−3.10)	CHEMICAL	0.0080 ** (2.02)	−0.0033 * (−1.74)
Adj-R^2	0.10	0.41	Adj-R^2	0.43	0.42
Obs.	531	531	Obs.	241	241
Firms	106	106	Firms	46	46

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

In Model (4), the coefficient of CSRMD was negative and significant, indicating that the degree of dispersion of analyst earnings forecasts was reduced when the mandatory disclosure policy was implemented. The CSRMD*CSRMA coefficient was also negative, which is consistent with the inference of H2b. This means that Taiwan's mandatory assurance management policy on CSR reports further reduced the dispersion of analyst earnings forecasts; however, this result was not significant. Moreover, the CSRMA coefficient was negative with a 0.05 level of significance. This means that the mandatory assurance management policy on CSR reports decreased the analyst earnings forecast dispersion. It also implies that accountant assurance increased the credibility of CSR reports, which allowed analysts to make predictions and decrease the dispersion of earnings forecasts.

This study provides empirical results under the mandatory provisions on CSR reports. First, the empirical results of this study showed that the mandatory disclosure management policy on CSR reports enables improvement in the accuracy of analyst earnings forecasts and reduction in the dispersion of analyst earnings forecasts. Therefore, this study argues that the mandatory disclosure management policy on CSR reports can improve the information transparency of the capital market. Some studies pointed out that corporate governance is one of the important factors affecting a company's voluntary disclosure of CSR reports (Alfraih and Almutawa 2017; Zhou 2019). Therefore, based on the results of this study, we argue that countries with less complete corporate governance mechanisms should consider adopting a mandatory disclosure management policy on CSR reports. Next, this study explores whether the mandatory assurance management policy on CSR reports can further improve the accuracy of analyst earnings forecasts and reduce the dispersion of analyst earnings forecasts. The results showed that the mandatory assurance management policy on CSR reports can further improve the accuracy of analyst earnings forecasts. It can also further reduce the dispersion of analyst earnings forecasts, but the

effect was not significant. This may be because the effects of the mandatory disclosure management policy on CSR reports and the mandatory assurance management policy on CSR reports are similar, so the incremental effects of the mandatory assurance policy on CSR reports are not so significant. Taking the effect of the mandatory assurance policy on CSR reports into consideration alone, the policy can improve the accuracy of analyst earnings forecasts, but it was not significant, and reduce the dispersion of analyst earnings forecasts. On the whole, the mandatory assurance policy on CSR reports has a positive effect on analyst earnings forecasts. Peng (2020) pointed out that family-controlled companies are not willing to undertake assurance for their CSR reports voluntarily. Therefore, based on the results of this study, we argue that countries with family-controlled business dominance should consider adopting a mandatory assurance management policy on CSR reports.

4.3. Further Analysis

4.3.1. Further Analysis for Hypotheses 1a and 1b

The first purpose of this paper is to explore the impact of Taiwan's partial CSR report mandatory disclosure policy on analysts' earnings forecasts. The sample firms are companies that have mandatory disclosure of CSR under the regulation. To improve the robustness of hypotheses H1a and H1b, this study further uses six company characteristics (asset size, net sales, ROA, ROE, debt ratio, Tobin's Q) to match a control group among companies that have never issued CSR reports by the propensity score matching (PSM). A total of 48 companies were successfully matched. Then, we collected analyst earnings forecast data for the 48 companies. Among them, 27 companies with a significant amount of missing data were excluded. The remaining 21 companies served as the control group. Then, we adopted the difference-in-difference method to compare the experiment group (companies with mandatory disclosure of CSR) and control group (companies that have never issued CSR reports) to see the effect of CSR report mandatory disclosure policy. By employing the difference-in-difference research design, according to the regulation of mandatory disclosure of CSR setting, we can significantly alleviate the endogenous problem. Models (5) and (6) were established as follows:

$$\begin{aligned} AFA_{i,t} &= \beta_0 + \beta_1 CSRMD_{i,t} + \beta_2 CSRMD_{i,t}{*}MDG_{i,t} + \beta_3 MDG_{i,t} + \beta_4 SIZE_{i,t} + \\ &\beta_5 STDROE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 STDEPS_{i,t} + \beta_8 LOSS_{i,t} + \beta_9 FOOD_{i,t} + \beta_{10} CHEMICAL_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{5}$$

$$\begin{aligned} AFD_{i,t} &= \beta_0 + \beta_1 CSRMD_{i,t} + \beta_2 CSRMD_{i,t}{*}MDG_{i,t} + \beta_3 MDG_{i,t} + \beta_4 SIZE_{i,t} + \\ &\beta_5 STDROE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 STDEPS_{i,t} + \beta_8 LOSS_{i,t} + \beta_9 FOOD_{i,t} + \beta_{10} CHEMICAL_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{6}$$

CSRMD is CSR report mandatory disclosure policy. The period before the implementation of the mandatory disclosure policy on CSR reports, CSRMD, is set to 0 (i.e., 2012–2014), and the period after the issuance of the policy, CSRMD, is set to 1 (i.e., 2015–2019). MDG is a mandatory disclosure group dummy variable. For companies that are forced to disclose CSR reports, MDG is set to 1; for companies that have never issued CSR reports, MDG is set to 0. CSRMD*MDG is the interaction term of CSRMD and MDG. The remaining variables are the same as Model (1).

The empirical results are listed in Table 5. In Model (5), the dependent variable is AFA. The coefficient of CSRMD*MGD is significantly positive at the 10% level, indicating that for companies that were forced to disclose CSR reports, compared with companies that have never issued CSR reports, the analyst earnings forecast accuracy improved after the CSR report mandatory disclosure policy. H1a (the mandatory disclosure management policy on CSR reports can improve the analysts' forecast accuracy) is supported. In Model (6), the dependent variable is AFD. The coefficient of CSRMD*MDG is significantly negative at the 10% level, indicating that for companies that were forced to disclose CSR reports, compared with companies that have never issued CSR reports, the dispersion in analyst earnings forecasts decreased after the CSR report mandatory disclosure policy. H1b (the mandatory disclosure management policy on CSR reports can decrease the dispersion in analyst forecasts) is supported.

4.3.2. The Comparisons between Accountant Assurance and Other Third-Party Assurance

The second objective of this research is to determine whether Taiwan's mandatory assurance management policy on CSR reports can further improve analyst forecast accuracy and decrease analyst forecast dispersion of companies mandated under this policy.

Simnett et al. (2009) pointed out that companies seeking to enhance the credibility of their reports and build their corporate reputation are more likely to have their sustainability reports assured, although it does not matter whether the assurance provider comes from the auditing profession. They also found that companies operating in stakeholder-oriented countries are more likely to choose the auditing profession as an assurer. Pflugrath et al. (2011) pointed out that CSR messages are more credible when they are convincing and authenticated. They found that in the United States, such guarantees are most valuable when done by professional accountants.

The present study further compared the effects of accountant assurance with third-party assurance, so samples that did not submit CSR reports for assurance were not included (39 firms). Models (7) and (8) were established to compare the effects of accountant assurance with those of third-party assurance.

$$\begin{aligned} AFA_{i,t} &= \beta_0 + \beta_1 CSRMD_{i,t} + \beta_2 CSRMD_{i,t}{*}CSRMB_{i,t} + \beta_3 CSRMB_{i,t} + \beta_4 SIZE_{i,t} + \\ &\beta_5 STDROE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 STDEPS_{i,t} + \beta_8 LOSS_{i,t} + \beta_9 FOOD_{i,t} + \beta_{10} CHEMICAL_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{7}$$

$$\begin{aligned} AFD_{i,t} &= \beta_0 + \beta_1 CSRMD_{i,t} + \beta_2 CSRMD_{i,t}{*}CSRMB_{i,t} + \beta_3 CSRMB_{i,t} + \beta_4 SIZE_{i,t} + \\ &\beta_5 STDROE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 STDEPS_{i,t} + \beta_8 LOSS_{i,t} + \beta_9 FOOD_{i,t} + \beta_{10} CHEMICAL_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{8}$$

CSRMB is CSR report mandatory assurance by an accountant. If a company takes the CSR report to an accountant for assurance, then CSRMB was set to 1; if it takes the CSR report to other third parties, then CSRMB was set to 0. The remaining variables are the same as Model (1).

The results are shown in Table 5. In Model (7), the coefficients of CSRMD and CSRMD*CSRMB were both positive and significant, indicating that, compared to third-party assurance, accountant assurance can further improve the accuracy of earnings forecasts. The CSRMB coefficient itself was also positive which means that, compared to third-party assurance, accountant assurance increased the accuracy of earnings forecasts; however, the effect was not statistically significant.

In Model (8), the CSRMD was negative and significant while the CSRMD*CSRMB coefficient was insignificant which means that, compared to third-party assurance, accountant assurance cannot further reduce the dispersion of analyst earnings forecasts. The CSRMB coefficient itself was negative with a 0.01 level of significance. This means that compared to third-party assurance, accountant assurance decreased the analyst forecast dispersion more significantly.

When we compare accountant assurance with other third-party assurance, the results showed that accountant assurance itself can increase the accuracy of analyst forecasts (but not significantly) and significantly reduce the degree of dispersion of analysts' forecasts. It reveals that the effects of accountant assurance in increasing the analysts' forecast accuracy and reducing the analysts' forecast dispersion are more obvious than that of third-party assurance. The reason may be that analysts believe that CSR report assurance provided by accountants is more credible than that by other third-party providers. This also implies that analysts are less familiar with third-party assurance providers.

5. Conclusions

This study takes 85 listed companies in the TWSE that are forced to disclose CSR reports as a research sample and discusses the impact of a CSR report mandatory disclosure policy on analyst earnings forecasts. For some of the companies forced to disclose CSR reports, they are further forced to submit CSR reports to accountants for assurance. Therefore, this study further explores the impact of a CSR report mandatory assurance policy on analyst earnings forecasts. The results show that Taiwan's partial mandatory disclosure

and mandatory assurance policies have positive effects on analyst forecasts. Based on the empirical results, this paper suggests the following:

For the national government: the government of Taiwan must continue instituting mandatory disclosure and authentic assurance of CSR reports as Taiwan's stock market is an emerging capital market. Through the management of the CSR reports, a company's non-financial information and transparency can be improved, and it helps analyst predictions. In the long run, it will be beneficial to the development of the capital market. Therefore, we suggest that at present, only some companies must compulsorily disclose or assure CSR reports. In the future, the management authority can further demand other companies that meet other conditions to compulsorily disclose and assure CSR reports.

For companies: at present, only some companies are forced to disclose and assure their CSR reports. It is expected that more companies will be required to compulsorily disclose or assure their CSR reports in the future to improve information transparency and credibility. Facing the future trend of CSR report mandatory disclosure and mandatory assurance policies, companies should be prepared for CSR management, disclosure, and assurance.

For third-party assurance providers: the result of this paper showed that if the CSR report is subjected to assurance via accountants, then the effects of increasing the analysts' forecast accuracy and reducing the analysts' forecast dispersion are more significant; analysts seem to have more confidence in the CSR reports convinced and authenticated by accountants. We suggest that third-party assurance providers should continue to increase their credibility to strive for CSR report assurance business.

Author Contributions: Conceptualization, T.-Y.T.; Data curation, N.-S.S.; Formal analysis, T.-Y.T.; Investigation, T.-Y.T. and N.-S.S.; Methodology, T.-Y.T.; Writing—original draft, T.-Y.T.; Writing—review & editing, T.-Y.T. and N.-S.S.; Revision of the manuscript, T.-Y.T. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Ministry of Science and Technology, Taiwan, R.O.C., the contract number is "MOST 108-2635-H-035-003-".

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Restrictions apply to the availability of these data. Data was obtained from the Taiwan Economic Journal (TEJ) and are available from the corresponding author with the permission of the TEJ.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Taiwan Stock Exchange Corporation Rules Governing the Preparation and Filing of Corporate Social Responsibility Reports by TWSE Listed Companies (Date: 26 November 2014).

Note: The criteria for compulsory disclosure of CSR report companies are listed in Article 2 and the criteria for compulsory assurance of CSR report companies are listed in Article 5. Both articles are shown below.

Article 2

Where a listed company is under one of the following circumstances, it shall prepare and file a corporate social responsibility report in Chinese according to these Rules.

1. At the end of the most recent fiscal year, the company falls into the food industry, chemical industry and financial and insurance industry prescribed in the Taiwan Stock Exchange Corporation Key Points for Classifying and Adjusting Categories of Industries of Listed Companies.
2. The financial report for the most recent fiscal year submitted pursuant to Article 36 of the Securities and Exchange Act indicates that no less than 50% of the company's revenue is derived from food and beverage.

3. The financial report for the most recent fiscal year submitted pursuant to Article 36 of the Securities and Exchange Act indicates that the company's capital stock has achieved no less than NT$10 billion.

The term "financial report" referred to in paragraphs 2 and 3 means the consolidated financial report prepared in accordance with the "regulations governing the preparation of financial reports by specific industries" made and promulgated by the competent authorities. If a listed company has no subsidiary, the financial report means an individual financial report.

Article 5 (part)

The corporate social responsibility reports prepared by the food industry and the listed companies prescribed under Subparagraph 2, Paragraph 1, Article 2 of the Rules shall obtain a CPA's letter of opinion issued according to the rules published by the Accounting Research and Development Foundation, ROC.

References

Aerts, Walter, Denis Cormier, and Michel Magnan. 2008. Corporate environmental disclosure, financial markets and the media: An international perspective. *Ecological Economics* 64: 643–59. [CrossRef]

Alfraih, Mishari M., and Abdullah M. Almutawa. 2017. Voluntary disclosure and corporate governance: Empirical evidence from Kuwait. *International Journal of Law and Management* 59: 217–36. [CrossRef]

Al-Tuwaijri, Sulaiman A., Theodore E. Christensen, and K. E. Hughes II. 2004. The relations among environmental disclosure, environmental performance, and economic performance: A simultaneous equations approach. *Accounting, Organizations and Society* 29: 447–71. [CrossRef]

Anderson, John C., and Alan W. Frankle. 1980. Voluntary social reporting: An iso-beta portfolio analysis. *The Accounting Review* 55: 467–79.

Atiase, Rowland Kwame. 1985. Predisclosure information, firm capitalization, and security price behavior around earnings announcements. *Journal of Accounting Research* 23: 21–36. [CrossRef]

Barron, Orie E., and Pamela S. Stuerke. 1998. Dispersion in analysts' earnings forecasts as a measure of uncertainty. *Journal of Accounting, Auditing & Finance* 13: 245–70.

Casey, Ryan J., and Jonathan H. Grenier. 2015. Understanding and contributing to the enigma of corporate social responsibility (CSR) assurance in the United States. *Auditing: A Journal of Practice & Theory* 34: 97–130.

Dhaliwal, Dan S., Oliver Zhen Li, Albert Tsang, and Yong George Yang. 2011. Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review* 81: 59–100. [CrossRef]

Dhaliwal, Dan S., Oliver Zhen Li, Albert Tsang, and Yong George Yang. 2014. Corporate social responsibility disclosure and the cost of equity capital: The roles of stakeholder orientation and financial transparency. *Journal of Accounting and Public Policy* 33: 328–55. [CrossRef]

Dhaliwal, Dan S., Suresh Radhakrishnan, Albert Tsang, and Yong George Yang. 2012. Nonfinancial disclosure and analyst forecast accuracy: International evidence on corporate social responsibility disclosure. *The Accounting Review* 87: 723–59. [CrossRef]

Eames, Michael, and Steven M. Glover. 2003. Earnings predictability and the direction of analysts' earnings forecast errors. *The Accounting Review* 78: 707–24. [CrossRef]

Edgley, Carla Rhianon, Michael John Jones, and Jill Frances Solomon. 2010. Stakeholder inclusivity in social and environmental report assurance. *Accounting Auditing & Accountability Journal* 23: 532–57.

Garrido-Miralles, Pascual, Ana Zorio-Grima, and María A. García-Benau. 2016. Sustainable development, stakeholder engagement and analyst forecasts' accuracy: Positive evidence from the Spanish setting. *Sustainable Development* 24: 77–88. [CrossRef]

Griffin, Paul A., and Yuan Sun. 2013. Going green: Market reaction to CSR wire news releases. *Journal of Accounting and Public Policy* 32: 93–113. [CrossRef]

Han, Bong H., and David Manry. 2000. The implications of dispersion in analysts' earnings forecasts for future ROE and future return. *Journal of Business Finance & Accounting* 27: 99–125.

Hayn, Carla. 1995. The information content of losses. *Journal of Accounting and Economics* 20: 125–53. [CrossRef]

Healy, Paul M., and Krishna. G. Palepu. 2001. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics* 31: 405–40. [CrossRef]

Herrmann, Don, and Wayne B. Thomas. 2005. Rounding of analyst forecasts. *The Accounting Review* 80: 805–23. [CrossRef]

Hodge, Frank D. 2001. Hyperlinking unaudited information to audited financial statements: Effects on investor judgments. *The Accounting Review* 76: 67–691. [CrossRef]

Hodge, Kristy, Nava Subramaniam, and Jenny Stewart. 2009. Assurance of sustainability reports: Impact on report users' confidence and perceptions of information credibility. *Australian Accounting Review* 19: 178–94. [CrossRef]

Hope, Ole Kristian. 2003. Disclosure practices, enforcement of accounting standards, and analysts' forecast accuracy: An international study. *Journal of Accounting Research* 41: 235–72. [CrossRef]

Hsu, Audrey, Kevin Koh, Sophia Liu, and Yen H. Tong. 2019. Corporate social responsibility and corporate disclosures: An investigation of investors' and analysts' perceptions. *Journal of Business Ethics* 158: 507–34. [CrossRef]

Imhoff, Eugene A., and Gerald J. Lobo. 1992. The effect of ex ante earnings uncertainty on earnings response coefficients. *The Accounting Review* 67: 427–39.

Kamran, Mahdieh, Gholamhosein Asadi, and Hamideh Asna Ashari. 2020. Investigating of the Nonlinear Relationship between Voluntary Disclosure and Firm Value by the Use of PSTR Model. *Accounting and Auditing Review* 27: 231–57.

Kolk, Ans, and Paolo Perego. 2010. Determinants of the adoption of sustainability assurance statements: An international investigation. *Business Strategy and the Environment* 19: 182–98. [CrossRef]

Kross, William, Byung Ro, and Douglas Schroeder. 1990. Earnings expectations: The analysts' information advantage. *The Accounting Review* 65: 461–76.

Lang, Mark H., and Russell J. Lundholm. 1996. Corporate disclosure policy and analyst behavior. *The Accounting Review* 71: 467–92.

Libby, Robert. 1979. Bankers' and auditors' perceptions of the message communicated by the audit report. *Journal of Accounting Research* 17: 99–122. [CrossRef]

Livnat, Joshua, and Yuan Zhang. 2012. Information interpretation or information discovery: Which role of analysts do investors value more? *Review of Accounting Studies* 17: 612–41. [CrossRef]

Lu, Yingjun, and Indra Abeysekera. 2021. Do investors and analysts value strategic corporate social responsibility disclosures? Evidence from China. *Journal of International Financial Management & Accounting* 32: 147–81.

Moroney, Robyn, Carolyn Windsor, and Yong Ting Aw. 2012. Evidence of assurance enhancing the quality of voluntary environmental disclosures: An empirical analysis. *Accounting & Finance* 52: 903–39.

Nichols, Craig, and Matthew M. Wieland. 2009. Do Firms' Nonfinancial Disclosures Enhance the Value of Analyst Services? Working Paper. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1463005 (accessed on 13 January 2022).

Pany, Kurt, and Charles H. Smith. 1982. Auditor association with quarterly financial information: An empirical test. *Journal of Accounting Research* 20: 472–81. [CrossRef]

Payne, Jeff L., and Sean W. G. Robb. 2000. Earnings management: The effect of ex ante earnings expectations. *Journal of Accounting, Auditing & Finance* 15: 371–92.

Peng, Chih Wei. 2020. Do family firms engage in voluntary external assurance of corporate social responsibility reports? *Corporate Management Review* 40: 1–33.

Pflugrath, Gary, Peter Roebuck, and Roger Simnett. 2011. Impact of assurance and assurer's professional affiliation on financial analysts' assessment of credibility of corporate 40 social responsibility information. *Auditing: A Journal of Practice & Theory* 30: 239–54.

Plumlee, Marlene, Darrell Brown, Rachel M. Hayes, and R. Scott Marshall. 2015. Voluntary environmental disclosure quality and firm value: Further evidence. *Journal of Accounting and Public Policy* 34: 336–61. [CrossRef]

Quick, Reiner, and Petra Inwinkl. 2020. Assurance on CSR reports: Impact on the credibility perceptions of non-financial information by bank directors. *Meditari Accountancy Research* 28: 833–62. [CrossRef]

Reverte, Carmelo. 2020. Do investors value the voluntary assurance of sustainability information? Evidence from the Spanish stock market. *Sustainable Development* 29: 793–809. [CrossRef]

Simnett, Roger, and Michael Nugent. 2007. Developing an assurance standard for carbon emissions disclosures. *Australian Accounting Review* 17: 37–47. [CrossRef]

Simnett, Roger, Ann Vanstraelen, and Wai Fong Chua. 2009. Assurance on sustainability reports: An international comparison. *The Accounting Review* 84: 937–67. [CrossRef]

Stuart, Andrew C., Jean C. Bedard, and Cynthia E. Clark. 2020. Corporate social responsibility disclosures and investor judgments in difficult times: The role of ethical culture and assurance. *Journal of Business Ethics* 171: 565–82. [CrossRef]

Sveiby, Karl Erik. 1997. The intangible assets monitor. *Journal of Human Resource Costing & Accounting* 2: 73–97.

Swaminathan, Siva. 1991. The impact of SEC mandated segment data on price variability and divergence of beliefs. *The Accounting Review* 66: 23–41.

Tabachnick, Barbara G., and Linda S. Fidell. 2007. *Using Multivariate Statistics*. London: Pearson/Allyn & Bacon.

Velte, Patrick. 2020. Determinants and consequences of corporate social responsibility assurance: A systematic review of archival research. *Society and Business Review* 16: 1–25. [CrossRef]

Wallace, Wanda A. 2004. The economic role of the audit in free and regulated markets: A look back and a look forward. *Research in Accounting Regulation* 17: 267–98. [CrossRef]

Zhou, Chao. 2019. Effects of corporate governance on the decision to voluntarily disclose corporate social responsibility reports: Evidence from China. *Applied Economics* 351: 5900–10. [CrossRef]