An Analysis of the Relationship between Corporate Social Responsibility and Analyst EPS Forecasts

[1]Chia-Jung Tu, [2]Chia-Ching Tu*

1Department of Marketing at Kainan University,No.1 Kainan Road, Luzhu Dist., Taoyuan City 33857, Taiwan, R.O.C.

Phone Number：(86) 3-3412500＃7913

Email: cjtu@mail.knu.edu.tw

2Correspondence: Department of Educational Management, Krirk University, Address: 43/1111 Ram-indra Road, KM.1, Bang Khen, Bangkok 10220 THAILAND

TEL:(66) 2-970-5820; FAX: (66) 2-552-3500

mail address: tulisa0929@gmail.com

Abstract

This study chooses and identifies enterprises from among the Taiwan 50 Index which have been selected for entry into the DJSI–Emerging Markets as the experimental group, and enterprises that have never been selected as the control group. By dividing the Taiwan 50 Index into a "group of consecutively selected enterprises" and a "group of enterprises never selected", the study explores changes in the EPS forecasts by analysts about both groups from 2013 to 2019.Then, this study explores the connection betweenan enterprise's consecutive selection for entry into the DJSI–Emerging Markets, the number of analyst followers, and the analysts' EPS forecast accuracy.The empirical results demonstrate that no significantly positive and optimistic changes in the analysts' EPS forecasts of the "group of consecutively selected enterprises". Next, this study also found that when analysts may not be able to provide precise forecasts of enterprises all the times.Finally, this study found that it appears that even if an enterprise is followed by more analysts making forecasts, the analysts' forecast accuracy remains unaffected.

1. Introduction

The concept of corporate social responsibility (CSR), which originated in advanced western countries, has become widely popularized all over the world for more than a decade. It signifies the principle that when an enterprise is creating profit and being responsible for shareholders' interest, it shall at the same time also be responsible for employees, society and environment, in order to achieve the goals of economic prosperity, social welfare and environmental sustainability. Even renowned business magazines such as Fortune and Forbes are used to adding the

"social responsibility" indicator to its evaluation of the ranking of companies. This shows that CSR has become a trend that the sustainable operations of business have to face.

The Dow Jones Sustainability Index (DJSI), founded in 1999, was jointly launched by Dow Jones enterprises, STOXX and Sustainable Asset Management (SAM). From the three dimensions ofeconomy, society, and environment, DJSI evaluates business opportunities and risks of enterprisesin terms of strategies, management and specific factors of the industry, to quantify the sustainability index among enterprises. As one of the most credible corporate sustainability rating tools in the world and an important reference indicator for global investment institutions, DJSI is released to the public periodically in September of each year. According to the findings of Knoepfel (2001), any constituent stock included by DJSI can help improve the corporate image of an enterprise among investors and the general public. It is clear that the issue of CSR is an issue the world is concerned with, and CSR performance also serves as an important indicator for the selection of stocks by investors.

In recent years, Taiwanese businesses have made the best effort to practice CSR to facilitate their sustainable development. The Ministry of Economic Affairs also amended the Company Act in 2017 by incorporating CSR into Article 1 of the Act. It appears that CSR has become the only way in which an enterprise may launch onto the global market. Given the continuous development of the capital market, the role played by securities analysts in the capital market is becoming more and more important. Considering that securities analysts play an important role as intermediaries dedicated to communicating messages in the capital market, they are able to present evaluation reports based on their analyses and understanding of certain information, using their expertise and strength in collecting information, and thereby affectingthe decisions of investors. Therefore, this study chooses and identifies enterprises from among the Taiwan 50 Index which have been selected for entry into DJSI–Emerging Markets consecutively as the experimental group, and those who have never been selected as the control group. By dividing the Taiwan 50 Index into a "group of consecutively selected enterprises" and a "group of enterprises never selected", this study explores changes in the earnings per share (EPS) forecasts by analysts about both groups and the accuracy of such forecasts from 2013 to 2019.

First of all, this study probes whether the changes in the EPS forecasts by analystsof the consecutively selected enterprises areoverly optimistic compared to enterprises that have never been selected. The Taiwan 50 Index consists of Taiwanese businesses with benchmark weighted value, most of which have stable profits and positive corporate images. When an enterprise has been selected for entry into DJSI–Emerging Markets consecutively, it means that the enterprise can not only create financial value but also have more positive influence on the surrounding environment and society. The empirical results demonstrate that no changes in the EPS forecasts by analystsof the "group of consecutively selected enterprises" appear to be significantly optimistic compared to the "group of enterprises never selected".Therefore, this study presumes that the stable businesses and positive corporate identitiesof enterprises are reflected in the EPS forecastsby analysts when the enterprisespractice CSR and corporate governance. The awards won by enterprisesfor being selected consecutively fortheir practice of CSR are nothing but icing on the cake, and thus not likely to have much of the information announcement effect.

Next, the study explores the effect of consecutive selection into the DJSI–Emerging Marketson the EPS forecast error of analysts. The more an enterprise invests in CSR, the more transparent the information disclosure will be, allowing analysts to access more information from the market and to rationally provide correct forecastsof the enterprise. According to the empirical results, when analysts receive massive amounts of complicated information, theymay need to spend more time and energy sorting out the information. As a result, they might not be able to provide precise forecastsof the enterprises all the time.Finally, this study explores the connection between the number of analyst followers and the accuracy of the EPS forecasts by analysts. The findings show that even if an enterprise is followed by more analysts making forecasts, the accuracy of the forecastsof the analysts remains unchanged. Though the empirical results do not meet the expected hypotheses, we still expect that the issues explored by the study can help Taiwan businesses which have not yet practiced CSR satisfactorily face and deal with

the positive development trend for CSR.

2. Literature Review and HypothesisGenerating

2.1 Corporate Social Responsibility

The concept of corporate social responsibility (CSR)was proposed for the first time in 1953 by H.R. Bowen in the book *Social Responsibilities of the Businessman*, who believed that the original definition of CSR should mean that entrepreneurs should take social values and goals into consideration when making any decision or taking any action related to an organization's business objectives. Since then, the concept of CSR has been widely discussed by people from various sectors.

Brown and Dacin (1997) found that excellent CSR performance could improve an enterprise's goodwill and brand value, and also consumers' evaluation on the enterprise, thus increasing sales (Lev et al., 2010) and the enterprise's financial performance(McGuire et al., 1988; McWilliams andSiegel, 2000; Wu et al., 2020; Okafor et al., 2021).Furthermore, enterprises with better reputations and those that improve employee benefits through the practice of CSR can recruit more excellent talent and encourage employees to improve productivity (Roberts and Dowling, 2002; Edmans, 2011). In order to explore whether an enterprise's business performance has a connection with the practice of CSR, López et al. (2007) analyzed the profitability, business size and risk profile of 110 enterprises including those selected and not selected by DJSI from 1997 to 2004. The empirical results show that the difference in performance of enterprises selected for entry into the DJSI and those not selected resulted from the practice of CSR.

Shen and Chang (2008) explored whether CSR may help improve financial performance. The empirical results show that there is no evidence to prove that the average performance of an enterprise practicing CSR is superior to that of an enterprise not practicing CSR, while certain evidence shows that the financial performance of enterprises practicing CSR is comparatively poorer; in conclusion, the effect of CSR on financial performance is negative. Adam and Shavit (2008) believe that the U-shaped curve between CSR and financial performance means that an enterprise has to pay additional costs when it begins to invest in CSR and that, therefore, its profitability will be affected; notwithstanding, the corporate images and goodwill enhanced upon the enterprise's investment in CSR will have a positive effect on its profitability. Cardebat and Sirven (2010) selected 154 European companies as samples from 2000 to 2008, and found in their research that there were no signs that the practice of CSR improvesan enterprise's financial performance.Chinet al. (2014) indicated that there are no absolute advantages or disadvantages to an enterprise's practice of CSR, as CSR is like a double-edged sword:if an enterprise adopts the correct strategies, it may benefit from an increase in returns and risk mitigation resulting from reputation effects, but if an enterprise cannot afford to bear the costs and expenses derived thereof, its business performance may worsen and its profitability could decline.Lee and Park (2010), Mulyadi and Anwar (2012) and Matuszak and Rózańska (2019) also found no significant relationship between corporate social responsibility and financial performance.

2.2 EPS Forecasts by Analysts and Corporate Social Responsibility

Past findings show that financial EPS forecasts and recommendationsby analysts are generally overly optimistic and tend to be incorrect (Francis and Philbrick, 1993; Das et al., 1998; Matsumoto, 2002; Richardson et al., 2004). From the point of view of economic incentives, Hong and Kubik (2003) found that analysts who release more optimistic reports might have better chancesof getting jobsat better investment banks. From the point of view of cognitive bias, Easterwood and Nutt (1999) and Beyer and Guttman (2011) indicated that the reason why forecasts are overly optimistic is because of the analyst's overreaction to good news and underreaction to bad news. Mikhail et al. (2009) and Wu et al. (2018)found that the EPS forecasts or stock recommendationsby analysts may not be correct because theyare affected by the emotions of investors. Brown (1997) found that S&P 500 corporate analystsare not overly optimistic, while non-S&P 500 corporate analysts tend to have optimistic forecasts in any economic cycle.

Denis et al. (2003) researched the new constituent stocks of the S&P 500 index, in order to discuss the EPS forecasts by analysts before and after the inclusion of these enterprises into the index.The research found that analysts tend to provide optimistic forecasts about the new constituent stocks of the S&P 500 index that and their EPS forecasts about the new constituent stocks are more accurate. Tu and Chang (2012) researched the new constituent stocks of the MSCI Taiwan Index Futures, in order to discuss how the EPS forecasts of all, domestic, and foreign analysts reacted to the stocks included into the MSCI Taiwan Index Futures. As a result, none of the analysts gave optimistic forecasts about the new constituent stocks and the matching companies.

Mahoney (1991) indicated that with respect to companies with sufficient information disclosure, different financial analysts almost gave identical forecast results. Lang and Lundholm (1996) and Alford and Berger (1999) explored the factors critical to the accuracy of analysts' forecasts. The result they discovered was that when a company is allowed to disclose more information based on its policies, the company's uncertainty will be mitigated and analysts may release more precise EPS forecasts and attract other analysts to follow them. Meanwhile, the information provided by analysts enables investors to make sure of the company's outlook. Lang et al. (2003) found that more analysts prefer to follow non-US-based enterprises listed on the American Stock Exchange than the enterprises which are not listed on the American Stock Exchange, and the accuracy of the analysts' forecastscan be improved, which allows the company to receive a higher rating on the market. Han and Manry (2010) also indicated that a company's information transparency helps improve the analysts' knowledge of the target company's future economic condition. Fauzi et al. (2007) and Jo and Harjoto (2011) found that if a company has better CSR performance, the independence of its Board of Directors and the shareholdings of its institutional investors also increase significantly, and the company will attract more analysts to pay attention and follow him(Bhandari and Kohlbeck, 2016; Lu and Abeysekera, 2021). Dhaliwal et al. (2012) performed a multi-national analysis on CSR reports from 31 countries, identifying CSR reports issued by companies as a collection of non-financial information. As a result, they found that the reports released by a company can help improve the financial forecasts by analysts, most notably in stakeholder-oriented countries. Becchetti et al. (2013) and Muslu et al. (2019) also found that CSR reporters with high disclosure scores are associated with more accurate forecasts.

According to the above literature, enterprises selected as constituent stocks of DJSI have good CSR performance which can raise the evaluation of enterprises by analysts. Therefore, this study has developed Hypothesis 1.

Hypothesis 1: Compared to enterprises which have never been selected for entry into DJSI–Emerging Markets, analysts tend to give more positive evaluations and optimistic EPS forecastsof those enterprises which have been selected consecutively.

The above literature shows that analysts are able to access more information about enterprises practicing CSR satisfactorily on a public market and give EPS forecasts about the enterprises correctly, and also attract other analysts to follow them. Moreover, according to the literature, enterprises which are followed by more analysts can better help analysts provide accurate forecasts. Therefore, this study has developedHypothesis 2 and Hypothesis 3.

Hypothesis 2: Compared to the enterprises which have never been selected for entry into DJSI–Emerging Markets, when an enterprise has been selected consecutively, its information disclosure is enhanced accordingly, which helps reduce the EPS forecast errors of analysts.

Hypothesis 3: The more analysts follow an enterprise, the more accurate the EPS forecast of enterprises by analysts will be.

3. Research and Discussion

3.1 Description of Samples

DJSI is the first index applied to evaluation benchmark for the social and environmental responsibilities of enterprises, and also one of the main tools forrating CSR in the world today. Currently, the DJSI series consists of

seven major sustainability indices, the DJSI–World, DJSI–Asia Pacific, DJSI–North America, DJSI–Europe, DJSI–Australia, DJSI–Emerging Markets and DJSI–Korea.

This study chooses and identifies enterprises from among the Taiwan 50 Index which have been selected for entry into the DJSI–Emerging Markets as the experimental group, and enterprises that have never been selected as the control group. By dividing the Taiwan 50 Index into a "group of consecutively selected enterprises – enterprises which have been selected for entry into the DJSI–Emerging Markets for more than two years (inclusive)" and a "group of enterprises never selected – enterprises which have never been selected for entry into the DJSI–Emerging Markets", the study explores changes in the EPS forecasts by analysts about both groups from 2013 to 2019.[1]Table 1 shows the number of enterprises among the Taiwan 50 Index that were selected for the first time, were selected consecutively, and were never selected for entry into the DJSI–Emerging Markets. Based on Table 1, the group of consecutively selected enterprises consists of 78 enterprises fromthe Taiwan 50 Index, and the group of enterprises never selected consists of 259 enterprises[2]. There were 13 enterprises selected for entry for the first time, but due to the sample size being too small, they are preliminarily excluded from the study.

The sources of data used by this study are: 1. The data about the Taiwan 50 Index is provided by UDNData and TWSE; 2. The data about enterprises selected for entry into the DJSI–Emerging Markets is provided by the DJSI website and domestic professional economic and financial websites; 3.The data about EPS forecasts by analysts, number of analyst followers, actual EPS and stock price of enterprises, business size, liability ratio and number of years for which enterpriseshave been established are provided by the Taiwan Economic Journal (TEJ) and based on financial information disclosed on the websites of governments and enterprises online. Enterprises with insufficient financial information are excluded from the samples.

3.2 Changes in EPS Forecasts by Analysts

DJSI releases the ratings of various internationally-renowned enterprises in the areas of thesustainable development of the environment, economy and society in September each year. How can the changes inan EPS forecast of an enterprise by an analyst before and after the release of the DJSI be calculated?This study uses the concepts of Denis et al. (2003), Tu and Chang (2012) and Tu (2017) to identify the date when DJSI releases rating results as the declaration date and chooses the latest EPS forecast provided by each analyst before the declaration date (provided that the interval between the latest EPS forecast and the declaration date does not exceed 4 months), and then calculates the median as the EPS forecastsof the enterprise by all the analysts before the declaration date. Then, the study chooses the first EPS forecast provided by each analyst in the same group of analysts (the group of analysts has provided EPS forecasts about the same enterprise before and after the declaration date) after the declaration date (provided that the interval between the declaration date and first EPS forecast does not exceed 4 months), and then calculates the median as the EPS forecasts of the enterprise by all the analysts after the declaration date.[3]The outcomes after the EPS forecast after the declaration date less the EPS forecast before the declaration date are identified as raw changes in EPS forecasts. Hypothesis 1 is stated as follows:

$$\Delta FE_i = FE_{i,+} - FE_{i,-}, \qquad\qquad (1)$$

ΔFE_i stands for the changes in the analyst's original EPS forecast of Company i. $FE_{i,-}$ stands for the analyst's EPS

---

[1]DJSI has added the "Emerging Market Index" since 2012. The selected Taiwanese businesses were included as the constituent stocks of the Index.

[2] Only the constituent stocks which are not added or deleted by Taiwan 50 Index 4 months before and after the announcement of DJSI–Emerging Markets in September each year are included in this research.

[3]The selection method is adopted by reference to the approaches mentioned in the articles of Denis et al. (2003), Tu and Chang (2012) and Tu (2017).

forecast of Company i before the date when DJSI releases its rating results. $FE_{i,+}$ stands for the analyst's EPS forecast of Company i after the date when DJSI releases its rating results.

For an enterprise which offers stocks at NT\$30 or NT\$300 per share, a change in EPS by NT\$10 per share has very different implications for the company. By the same token, for an enterprise which has EPS of NT\$10 or NT\$50, a change in EPS by NT\$10 per share also has very different implications for the company. Therefore, this study adopts the enterprise's stock price and EPS to deflate changes in the original EPS forecast, and the formula is changed into the following:

$$\Delta PFE_i = \frac{FE_{i,+} - FE_{i,-}}{P_{i,-}}, \qquad (2)$$

ΔPFE_i stands for the change in the original EPS forecast of Company i deflated by its stock price. $FE_{i,+}$ and $FE_{i,-}$ are defined as in the above formula. $P_{i,-}$ stands for the stock price of Company i on the last day of the month prior to the date when DJSI releases its rating results.

This study adopts the EPS forecast provided before the date when DJSI releases its rating results (values must be positive[4]) to deflate the changes in the original EPS forecast about the enterprise. The formula is stated as follows:

$$\Delta EFE_i = \frac{FE_{i,+} - FE_{i,-}}{FE_{i,-}}, \qquad (3)$$

ΔEFE_i stands for the outcome after the change in the original EPS forecast about the enterprise deflated by the EPS forecast provided before the date when DJSI releases its rating results. $FE_{i,+}$ and $FE_{i,-}$ are defined as in the above formula.

After calculating the change value of the EPS forecasts of enterprises consecutively selected and never selected using formulas (1), (2) and (3), this study uses the independent sample t-test to check whether the change values of the enterprises in both groups differ significantly in order to confirm whether Hypothesis 1 should can be sustained.

3.3 Empirical Model

After verifying the changes in the analyst's EPS forecast, this study identifies the "absolute forecasting error" as proxy variables of the analyst's "forecast accuracy". According to the absolute forecasting error formula, we should first have the "actual EPS" of Company i less "each analyst's EPS forecast of Company i provided before the date when DJSI releases its rating result and finding the median therein" for the same year, and then seek the absolute value of the calculated values. The formula is specified as follows:

$$FError_i = \left| RE_{i,+} - FE_{i,-} \right|, \qquad (4)$$

$FError_i$ stands for the analyst's raw absolute forecast error of Company i. $RE_{i,+}$ stands for the "actual EPS" of Company i. $FE_{i,-}$ is defined and in the above formula. The greater the absolute forecast error value is, the more inaccurate the analyst's forecast is.

---

[4] In order to avoid negative results generated by deflating, the EPS forecasts adopt positive values only before the declaration date, while negative values are excluded.

By the same token, different stock prices and different EPS have different implications for an enterprise's absolute forecast error. Therefore, this study uses the enterprise's stock price and EPS to deflate the raw absolute forecasting error, and the formula is changed into the following:

$$\Delta PFError_i = \left| \frac{RE_{i,+} - FE_{i,-}}{P_{i,-}} \right| , (5)$$

$\Delta PFError_i$ stands for the raw absolute forecasting error of Company i deflated by its stock price. $FE_{i,+}$, $FE_{i,-}$ and $P_{i,-}$ are defined as in the above formula.

$$\Delta EFError_i = \left| \frac{RE_{i,+} - FE_{i,-}}{FE_{i,-}} \right| , (6)$$

$\Delta EFError_i$ stands for the outcomes after the raw absolute forecasting error of Company i deflated by the EPS forecast provided before the date when DJSI releases its rating results. $FE_{i,+}$ and $FE_{i,-}$ are defined as in the above formula.

This study uses an approach that is different from the onein the articles of Denis et al. (2003), Tu and Chang (2012) and Tu (2017), which apply the independent sample t-test to check whether there is any significant difference in the analyst's EPS forecast accuracy with respect to enterprises which are or are not incorporated in the S&P 500 or MSCI Taiwan Index Futures, or enterprises which do or do not receive syndicated loans. Instead, this study identifies the absolute forecasting error as the dependent variable in order to test whether the analyst's EPS forecast accuracy has a connection to the selection for entry into the DJSI–Emerging Markets. A test is performed based on the multiple regression equation. Hypotheses 2 and 3 are stated as follows:

$FError_{i,t} = \beta_0 + \beta_1 Dummy_{i,t} + \beta_2 Coverage_{i,t} + \beta_3 Size_{i,t} + \beta_4 Age_{i,t}$

$$+ \beta_5 Lev_{i,t} + \beta_6 EPS_{i,t} + \varepsilon_{i,t} (7)$$

$\Delta PFError_{i,t} = \beta_0 + \beta_1 Dummy_{i,t} + \beta_2 Coverage_{i,t} + \beta_3 Size_{i,t} + \beta_4 Age_{i,t}$

$$+ \beta_5 Lev_{i,t} + \beta_6 EPS_{i,t} + \varepsilon_{i,t} (8)$$

$\Delta EFError_{i,t} = \beta_0 + \beta_1 Dummy_{i,t} + \beta_2 Coverage_{i,t} + \beta_3 Size_{i,t} + \beta_4 Age_{i,t}$

$$+ \beta_5 Lev_{i,t} + \beta_6 EPS_{i,t} + \varepsilon_{i,t} (9)$$

Variables of the hypotheses referred to herein are defined and measured as follows:

(1) Dummy stands for dummy variable, =1 stands for enterprisesin the "group of consecutively selected enterprises", =0 stands for enterprisesin the "group of enterprises never selected".

(2) Coveragestands for the number of analyst followers, subject to the number of analysts who have provided EPS forecastsof the same enterprise at the same time within four months before and after the declaration date in the current year.

(3) Size stands for the business size, subject to log (book value of the total assets).

(4) Age stands for the number of years for which an enterprise has been incorporated.

(5) Lev stands for an enterprise's liability ratio which is total liabilities divided by total assets.

(6) EPS stands for an enterprise's EPS, which is the current net profit divided by the weighted average number of
   outstanding common shares.

This study includes certain control variables on the basis of past literature, including Size, Age, Lev and EPS (Lang and Lundholm, 1996; Weiss, 2010). Compared to enterprises which have never selected for entry into any index, analysts are able to access more information about enterprises practicing CSR satisfactorily on the public market and to give EPS forecastsof enterprises correctly, thus resulting in less EPS forecasting errors.This study thus expects that coefficient β_1, which stands for enterprises selected consecutively or never selected, should be negative or insignificant. Furthermore, according to the literature, the more analysts follow an enterprise, the more accurate the forecastsby analysts will be. Therefore, this study expects that coefficient β_2, which stands for the number of analyst followers, should be negative or insignificant.

4. Empirical Studies

4.1 Analysis ofthe Changes in the EPS Forecasts by Analysts

Based on the literature review, and in the process of collecting data on the EPS forecasts by analysts, the EPS forecasts of the same enterprise by analysts in the same year are more positive and optimistic at the very beginning (higher EPS forecast value) , after which the forecast is slowly adjusted downward (EPS forecast value adjusted downward). In other words, the value after an analyst's latest EPS forecast less their earlier (previous) EPS forecast of the same enterprise in the same year is generally negative. However, when an enterprise announces or receives good news, the analyst will maintain their previous optimistic forecast or even provide a more optimistic one.In Taiwan, when DJSI announces the enterprises selected by it to the public in September each year, would analysts maintain their previous positive and optimistic EPS forecasts about the enterprises that have been selected consecutively and only adjust their EPS forecastsof enterprises which have never been selected downward? Table 2 describes the changes in the EPS forecasts by analysts of the Taiwan 50 Index before and after the declaration date of DJSI–Emerging Markets from 2013 to 2019.

Table 2 shows that, during the sampling period, 70 enterprises from the"group of consecutively selected enterprises" and 197 enterprises from the "group of enterprises never selected"had complete data for further analysis and discussion. First of all, in the "changes in analysts' raw forecast" as shown in the third row, the changes in the analysts' raw EPS forecastsof the enterprises in the "group of consecutively selected enterprises" saw a downward adjustment of -0.00164, less than that for the enterprises in the "group of enterprises never selected", which saw a downward adjustment of -0.11022. Nevertheless, the average difference between both is 0.10858 (p-value=0.47649), which is considered insignificant. This shows that analysts do not necessarily provide more positive and optimistic forecasts even if enterpriseshave been selected by DJSI consecutively.

Next, based on the "changes in the analysts' raw forecast deflated by stock price" in the fourth row, the range of the adjustments made by analysts on the enterprises included in the "group of consecutively selected enterprises" range is 0.0378%, and 0.0951% for the enterprises includedin the "group of enterprises never selected". The average difference between both is -0.0573% (pre-value=0.78334), which is considered insignificant. Finally, based on the "changes in the analysts' raw forecast deflated by EPS" in the fifth row, the range of adjustments made by analysts on the enterprises included in the "group of consecutively selected enterprises"is 0.00198, and 0.31834 for the enterprises include into the "group of enterprises never selected". The average difference between both is -0.31636 (p-value-0.26804), which similarly shows that there is no significant difference in the range of the adjustment made

by analysts on their EPS forecastsof the two types of enterprises. These findings are similar to those of Tu and Chang (2012) and Tu (2017), showing thatthe information announcement effect in the market of Taiwan seems small.

Table 2 shows that compared to the constituent stocks of the Taiwan 50 Index which have never been selected for entry into the DJSI–Emerging Markets, the analysts do not provide more positive and optimistic EPS forecastsof enterprises that have been selected consecutivelyfor entry into the DJSI–Emerging Markets. Therefore, Hypothesis 1 cannot be sustained. From this it can be inferred that when enterprises are practicing CSR and corporate governance, the stable business and positive corporate image are already reflected in the EPS forecasts by analysts, while the awards won by enterprises for being selected consecutively for their practice of CSR are nothing but icing on the cake.

4.2 Multiple Regression Analysis Results

This study identifies various absolute forecasting errors calculated based on formulas (4), (5) and (6)as the dependent variables for the multiple regression analysis, and the Size, Age, Lev and EPS as the control variables, in order to test the connection between an enterprise's consecutive selectionfor entry into the DJSI–Emerging Markets, the number of analyst followers, and the analysts' EPS forecast accuracy. Table 3 shows the results of multiple regression analysis.

First, based on the dependent variables, namely the "raw absolute forecasting errors" and "raw absolute forecasting errors deflated by EPS" identified in the second and fourth columns, the analysts' absolute EPS forecast errors for enterprises which have been consecutively selected for entry into the index are small, as coefficient β_1 is -0.41963 and -0.61431, respectively, not significantly different from 0. The more analysts follow an enterprise, the smaller the enterprise's absolute EPS forecasting errors are. Coefficient $\beta_2$is -0.04724 and -0.07022, respectively, also not significantly different from 0. From both columns, we can see that the larger the Size, the older the Age and the higher the Lev, the smaller the absolute EPS forecasting errors of analysts are, although it is statistically insignificant. The higher the EPS of an enterprise, the larger the absolute EPS forecasting errors of analysts will be, which will also significantly differ from 0.

Furthermore, based on the dependent variables in the third column, the "raw absolute forecasting errors deflated by stock price", we can see that the coefficient β_1 for the analysts' absolute EPS forecasting errors about enterprises which have been consecutively selected for entry into the index is -0.00849 (p-value=0.00953), significantly different from 0 under a level of significance of 5%. This shows that analysts are able to provide EPS forecasts about these enterprises correctly because they have more related information; therefore, analysts have less absolute EPS forecasting errors. Moreover, for enterprises which are followed by more analysts, Coefficient β_2 for the analysts' absolute EPS forecasting errors is 0.00099, which does not significantly differ from 0. Finally, for control variables, the longer the Age is, the higher an enterprise's EPS will be. Therefore, analysts have less absolute EPS forecasting errors, and such errors will differ from 0 under a level of significance of 5%.

Table 3 shows that compared to the enterprises which have never been selected for entry into the index, analysts can access more information about those which practice CSR satisfactorily. However, analysts receive massive amounts of complicated information, theymay need to spend more time and energy sorting out the information. As a result, they may not be able to provide precise forecastsof enterprises all the time. Given this, Hypothesis 2 can only be sustained in part. It appears that even if an enterprise is followed by more analysts making forecasts, the analysts' forecast accuracy remains unaffected. Thisdiscovery differs from the one by Lang and Lundholm (1996), Alford and Berger (1999) and Lang et al. (2003). Therefore, Hypothesis 3 cannot be sustained.

5. Conclusion

By dividing the Taiwan 50 Index into a "group of consecutively selected enterprises – enterprises which have been selected for entry into the DJSI–Emerging Markets for more than two years (inclusive)" and a "group of enterprises never selected – enterprises which have never been selected for entry into the DJSI–Emerging Markets", this study

explored changes in the EPS forecastsby analysts and the forecast accuracy of analysts of both groups from 2013 to 2019.

The empirical results demonstrate that no significantly positive and optimistic changes in the analysts' EPS forecastsof the "group of consecutively selected enterprises". Therefore, the awards won by enterprises for being selected consecutively for their practice of CSR are nothing but icing on the cake, and thus not likely to have much of an information announcement effect. Given this, Hypothesis 1 cannot be sustained. Furthermore, this study also found that when analysts receive massive amounts of complicated information, they may need to spend more time and energy sorting out the information. As a result, they may not be able to provide precise forecastsof enterprises all the times. Given this, Hypothesis 2 can only be sustained in part.

Finally, this study explored the connection between the number of analyst followers and the analysts' EPS forecast accuracy. This study found that it appears that even if an enterprise is followed by more analysts making forecasts, the analysts' forecast accuracy remains unaffected. Therefore, Hypothesis 3 cannot be sustained. Taiwan is identified as a thin market, different from the markets of the USA, Japan and EU. The study results will inevitably vary depending on the different research subjects. Nevertheless, the practice of CSR practicing has been identified as a global development trend. We expect that the issues explored by this study can help Taiwanese businesses which do not yet practice CSR satisfactorily to face and deal with this positive development trend.

References

1. Adam, A. M., & Shavit, T. (2008). How can a ratings-based method for assessing corporate social responsibility (CSR) provide an incentive to firms excluded from socially responsible investment indices to invest in CSR? *Journal of Business Ethics, 82*(4), 899-905.

2. Alford, A. W., & Berger, P. G. (1999). A simultaneous equations analysis of forecast accuracy, analyst following, and trading volume. *Journal of Accounting, Auditing & Finance, 14*(3), 219-240.

3. Becchetti, L., Ciciretti, R., & Giovannelli, A. (2013). Corporate social responsibility and earnings forecasting unbiasedness. *Journal of Banking & Finance, 37*(9), 3654-3668.

4. Beyer, A., & Guttman, I. (2011). The effect of trading volume on analysts' forecast bias. *The Accounting Review, 86*(2), 451-481.

5. Bhandari, A., & Kohlbeck, M. J. (2016). Impact of Corporate Social Responsibility Activity on Analysts' Behavior. *Available at SSRN 2684099.*

6. Bowen, H. R., & Johnson, F. E. (1953). *Social responsibility of the businessman.* Harper.

7. Brown, L. D. (1997). Analyst forecasting errors: Additional evidence. *Financial Analysts Journal, 53*(6), 81-88.

8. Brown, T. J., & Dacin, P. A. (1997). The company and the product: Corporate associations and consumer product responses. *The Journal of Marketing,* 68-84.

9. Cardebat, J. M., & Sirven, N. (2010). What corporate social responsibility reporting adds to financial return? *Journal of Economics and International Finance, 2*(2), 020-027.

10. Chin, H. H., Miao, W. C., & Chuang Y. C. (2014). Is Corporate Social Responsibility a Double-edged Sword? Evidence from Fortune Global 500 Companies. *Journal of Management and Business Research, 31*(1), 1-19.

11. Das, S., Levine, C. B., & Sivaramakrishnan, K. (1998). Earnings predictability and bias in analysts' earnings forecasts.*Accounting Review,* 277-294.

12. Denis, D. K., McConnell J. J., OvtchinnikovA. V. and Yu Y., 2003, S&P 500 Index Additions and Earnings

Expectations, *The Journal of Finance*58, 1821-1840.

13. Dhaliwal, D. S., Radhakrishnan, S., Tsang, A., & Yang, Y. G. (2012). Nonfinancial disclosure and analyst forecast accuracy: International evidence on corporate social responsibility disclosure. *The Accounting Review, 87*(3), 723-759.

14. Easterwood, J. C., & Nutt, S. R. (1999). Inefficiency in analysts' earnings forecasts: Systematic misreaction or systematic optimism?. *The Journal of Finance, 54*(5), 1777-1797.

15. Edmans, A. (2011). Does the stock market fully value intangibles? Employee satisfaction and equity prices. *Journal of Financial economics, 101*(3), 621-640.

16. Fauzi, H., Mahoney, L. S., & Abdul Rahman, A. (2007). Institutional ownership and corporate social performance: Empirical evidence from Indonesian companies. *Issues in Social and Environmental Accounting, 1*(2), 334-347.

17. Francis, J., & Philbrick, D. (1993). Analysts' decisions as products of a multi-task environment. *Journal of Accounting Research*, 216-230.

18. Han, B. H., & Manry, D. (2000). The implications of dispersion in analysts' earnings forecasts for future ROE and future returns. *Journal of Business Finance & Accounting, 27*(1-2), 99-125.

19. Hong, H., & Kubik, J. D. (2003). Analyzing the analysts: Career concerns and biased earnings forecasts. *The Journal of Finance,58*(1), 313-351.

20. Jo, H., & Harjoto, M. A. (2011). Corporate governance and firm value: The impact of corporate social responsibility. *Journal of business ethics, 103*(3), 351-383.

21. Knoepfel, I. (2001). Dow Jones sustainability group index: A global benchmark for corporate sustainability. *Corporate Environmental Strategy, 8*(1), 6-15.

22. Lang, M. H., & Lundholm, R. J. (1996). Corporate disclosure policy and analyst behavior. *Accounting review*, 467-492.

23. Lang, M. H., Lins, K. V., & Miller, D. P. (2003). ADRs, analysts, and accuracy: Does cross listing in the United States improve a firm's information environment and increase market value? *Journal of Accounting Research, 41*(2), 317-345.

24. Lee, S., & Park, S. Y. (2010). Financial impacts of socially responsible activities on airline companies. *Journal of Hospitality & Tourism Research, 34*(2), 185-203.

25. Lev, B., Petrovits, C., & Radhakrishnan, S. (2010). Is doing good for you? How corporate charitable contributions enhance revenue growth. *Strategic Management Journal, 31*(2), 182-200.

26. López, M. V., Garcia, A., & Rodriguez, L. (2007). Sustainable development and corporate performance: A study based on the Dow Jones sustainability index. *Journal of Business Ethics,75*(3), 285-300.

27. Lu, Y., & Abeysekera, I. (2021). Do investors and analysts value strategic corporate social responsibility disclosures? Evidence from China. *Journal of International Financial Management & Accounting, 32*(2), 147-181.

28. Mahoney, W. F. (1991). *Investor relations: the professional's guide to financial marketing and communications*. New York Inst. of Finance.

29. Matsumoto, D. A. (2002). Management's incentives to avoid negative earnings surprises. *The Accounting Review, 77*(3), 483-514.

30. Matuszak, Ł., & Różańska, E. (2019). A non-linear and disaggregated approach to studying the impact of

CSR on accounting profitability: Evidence from the Polish banking industry. *Sustainability*, *11*(1), 183.

31. McGuire, J. B., Sundgren, A., & Schneeweis, T. (1988). Corporate social responsibility and firm financial performance.*Academy of management Journal*, *31*(4), 854-872.

32. McWilliams, A., & Siegel, D. (2000). Corporate social responsibility and financial performance: correlation or misspecification? *Strategic management journal*, *21*(5), 603-609.

33. Mikhail, M. B., Walther, B. R., & Willis, R. H. (2009). *Does investor sentiment affect sell-side analysts' forecast accuracy?* Working paper, Northwestern University.

34. Mulyadi, M. S., & Anwar, Y. (2012). Impact of corporate social responsibility toward firm value and profitability. *The Business Review, Cambridge*, *19*(2), 316-322.

35. Muslu, V., Mutlu, S., Radhakrishnan, S., & Tsang, A. (2019). Corporate social responsibility report narratives and analyst forecast accuracy. *Journal of Business Ethics*, *154*(4), 1119-1142.

36. Okafor, A., Adusei, M., & Adeleye, B. N. (2021). Corporate social responsibility and financial performance: Evidence from US tech firms. *Journal of Cleaner Production*, 126078.

37. Richardson, S., Teoh, S. H., & Wysocki, P. D. (2004). The walk-down to beatable analyst forecasts: The role of equity issuance and insider trading incentives. *Contemporary accounting research*, *21*(4), 885-924.

38. Roberts, P. W., & Dowling, G. R. (2002). Corporate reputation and sustained superior financial performance. *Strategic management journal*, *23*(12), 1077-1093.

39. Shen, C. H., & Chang, Y. (2008). Does Corporate Social Responsibility Improve Financial Performance? Evidence from Ftse4good UK Index. *Academia Economic Papers*, *36*(3), 339-385.

40. Tu,C. J. and Chang Y. C., 2012, Analyst Responses to Stock-Index Adjustments: Evidence from MSCI Taiwan Index Addition,*Review of Financial Economics*21, 82-89.

41. Tu, C. J. (2017). ANALYST RESPONSES TO THE ANNOUNCEMENTS OF SYNDICATED LOAN APPROVAL IN TAIWAN. *Advances in Investment Analysis and Portfolio Management (New Series)*,*8*(8), 67-81.

42. Weiss, D. (2010). Cost behavior and analysts' earnings forecasts. *The Accounting Review*, *85*(4), 1441-1471.

43. Wu, L., Shao, Z., Yang, C., Ding, T., & Zhang, W. (2020). The impact of CSR and financial distress on financial performance—evidence from Chinese listed companies of the manufacturing industry. *Sustainability*, *12*(17), 6799.

44. Wu, Y., Liu, T., Han, L., & Yin, L. (2018). Optimistic bias of analysts' earnings forecasts: Does investor sentiment matter in China?. *Pacific-Basin Finance Journal*, *49*, 147-163.

45. Pirnazarov, N. (2020). Philosophical analysis of the issue of spirituality. International Journal of Advanced Science and Technology, 29(5).

46. Berdimuratova, A. K., & Mukhammadiyarova, A. J. (2020). Philosophical and methodological aspects of the interaction of natural environment and man. International Journal of Pharmaceutical Research. https://doi.org/10.31838/ijpr/2020.12.03.235

47. Tzu-Chia Chen, Shu-Yan Yu, Haiying Zhang, Pirnazarov Nurnazar; ,"Application of Sustainable Education Innovation in the Integrated Teaching of Theory and Practice Adopted in the Auto Chassis Course--A Case Study on the Auto Repair Specialty of a Secondary Vocational School in Suzhou, China","Tobacco Regulatory Science (TRS) (Tob Regul Sci, Electronic ISSN 2333-9748)",7,6-1,7166-7189,2021,Tobacco Regulatory Science Group

Table 1. The number of enterprises among the Taiwan 50 Index that were selected for the first time, were selected consecutively, and were never selected for entry into the DJSI–Emerging Markets from 2013 to 2019.

Year	first time selected	selected consecutively	never selected
2013	1	7	42
2014	1	8	41
2015	1	9	40
2016	5	10	35
2017	0	15	35
2018	3	14	33
2019	2	15	33
Total	13	78	259

Table 2. The changes in the EPS forecasts by analysts of the Taiwan 50 Index that were selected consecutively and were never selected before and after the declaration date of DJSI–Emerging Markets from 2013 to 2019.

	1	2	3	4	5
Sample	Sample Size	Selected Consecutively	Sample Size	Never Selected	Mean Difference (col.2 – col. 4)
$\triangle FE$	70	NT$-0.00164 (0.97659)	197	NT$-0.11022 (0.43754)	NT$0.10585 (0.47649)
$\triangle PFE$	70	0.0378% (0.9142)	197	0.0951% (0.37544)	-0.0573% (0.78834)
$\triangle EFE$	69	0.00198 (0.89486)	196	0.31834 (0.26441)	-0.31636 (0.26804)

The p-values in parentheses test whether the numbers above are significantly different from zero.

Table 3. The results of multiple regression analysis.

This study identifies various absolute forecasting errors calculated based on formulas (4), (5) and (6) as the dependent variables for the multiple regression analysis, and the Size, Age, Lev and EPS as the control variables, in order to test the connection between an enterprise's consecutive selection for entry into the DJSI–Emerging Markets, the number of analyst followers, and the analysts' EPS forecast accuracy.

	/RE-FE-/	/(RE-FE-)/P-/	/(RE-FE-)/FE-/
intercept	3.20530	0.03619	7.91339
	(0.23888)	(0.19032)	(0.26010)
Dummy	-0.41963	-0.00849	-0.61431
	(0.19131)	(0.00953)**	(0.45867)
Coverage	-0.04724	0.00099	-0.07022
	(0.36664)	(0.06329)	(0.60341)
Size	-0.09363	-0.00061	-0.29731
	(0.53170)	(0.68814)	(0.44194)
Age	-0.01154	-0.00025	-0.02811
	(0.17420)	(0.00376)**	(0.20075)
Lev	-0.52338	-0.00474	-0.20449
	(0.50672)	(0.55376)	(0.91997)
EPS	0.06560	-0.00015	-0.00744
	(0.00000)***	(0.00846)**	(0.59956)
n	267	267	266

***: significant at the 1% level ; **: significant at the 5% level