Journal of
Risk and Financial Management

MDPI

Article

Corporate Social Responsibility and Capital Allocation Efficiency in Australia and New Zealand

Alexandre Garel [1], Alireza Tourani-Rad [2,*] and Shengze Xu [2]

[1] Finance Department, Audencia Business School, 44300 Nantes, France; agarel@audencia.com
[2] Department of Finance, Faculty of Business, Economics, and Law, Auckland University of Technology, Auckland 1010, New Zealand; shengze.xu@aut.ac.nz
* Correspondence: atourani@aut.ac.nz

Abstract: In this paper, we investigate whether a firm's Corporate Social Responsibility initiatives could affect its financial performance. We specifically investigate the firm's capital allocation efficiency as a moderating channel affecting their performance. We employ a comprehensive sample of Australian and New Zealand stock exchange-listed firms consisting of 3324 firm-year observations for the period 2004–2017. We do not find that the firm's capital allocation efficiency is negatively affected by the overall CSR scores or its two main components, namely the environmental or social dimensions. However, our empirical analysis exposes a challenging result for the firms in that we find strong evidence that extremely costly environmental CSR initiatives or policies (e.g., emission reduction, employee health and safety improvements, clean energy products) could reduce the firm's investment efficiency. Hence, firms need to follow a balancing act when contemplating CSR plans and investing in them. While investors appreciate moderate levels of investment in CSRs, they penalize those firms that invest excessively in such initiatives.

Keywords: CSR; firm performance; capital allocation efficiency

Citation: Garel, Alexandre, Alireza Tourani-Rad, and Shengze Xu. 2022. Corporate Social Responsibility and Capital Allocation Efficiency in Australia and New Zealand. *Journal of Risk and Financial Management* 15: 100. https://doi.org/10.3390/jrfm15030100

Academic Editor: Ali Meftah Gerged

Received: 19 January 2022
Accepted: 18 February 2022
Published: 23 February 2022

1. Introduction

Companies have increasingly been focusing on Corporate Social Responsibility (CSR) initiatives and adopting CSR policies as their corporate strategy. It has been reported that in the U.S., for example, Fortune Global firms invest around $20 billion a year on CSR activities (Meier and Cassar 2018). Globally, more than 90% of the 250 largest companies in the world produce an annual CSR report (KPMG 2017). Companies have been encouraged by both retail and institutional investors, and sometimes required by government and other regulatory bodies, to adopt environmental and social programs dealing with climate change and environmental issues to lessen the impact of their activities on the environment and develop eco-friendly policies (Linnenluecke et al. 2016; Banerjee et al. 2019). Globally, there has been serious support at both private and governmental levels for environmental initiatives; most notably, among others, is the UN Climate Change Conference, the latest of which, COP 26, was held in 2021 in Glasgow. Environmental and social issues have become a crucial issue for firms that they cannot overlook anymore. At the same time, given limited resources available to companies, their managers need to decide how much, if any, they can afford to commit to environmentally friendly projects. Balancing both environmental claims and financial requirements is indeed challenging for firms, and a number of studies in recent years have investigated if these two mounting tensions are conflicting or complementary for firms.

It must be noted that the CSR policies are not necessarily designed to create financial returns as there are other channels that CSR can affect firms and their stakeholders. Studies have shown that CSR adaptation has resulted in increased sales (Gneezy et al. 2010), effective human resources management measures that attract and motivate workers (Bhattacharya et al. 2008), and lobbying power (Bertrand et al. 2020). More recently, Dunbar et al.

(2021) examined the relationship between CSRs and firm risk, emphasizing the mediating role of corporate governance. The authors argued that CSR activities could lead to greater risk reduction for firms with governance characteristics, indicating stronger information intensity/transparency and corporate social performance alignment. Moreover, in the recent period of the COVID-19 pandemic, Garel and Petit-Romec (2021) showed that investors reward environmentally friendly firms with higher returns. They observed that the positive association between environmental responsibility and stock returns during the COVID-19 period is significantly more pronounced for firms with greater long-term investor ownership.

As for the implementation of CSR policies by firms and their impact on financial performance, there exists extensive literature. However, these studies document mixed results. While some papers observe a positive relationship between the CSR programs and financial performance (e.g., Flammer 2013; Kim et al. 2014), others find opposite results (e.g., Hong and Kacperczyk 2009; Krüger 2015).

In our study, we adopt a particular angle and investigate the relationship between the CSR policies and a key firm's financial performance, i.e., capital allocation efficiency. Our empirical framework is closely related to a recent U.S.-based research by Bhandari and Javakhadze (2017). They indicated that CSR activities are negatively associated with a firm's financial performance by affecting firm-level capital allocation efficiency. In our study, we concentrate on the Australian and New Zealand markets. To the best of our knowledge, there are no other studies investigating the link between CSR and investment efficiency at the firm level in any other country. Given the difference in national financial market characteristics as well as the corporate CSR policies and objectives between the U.S. and Australia and New Zealand, our study will shed extra light on the adaptation of CSR and a firm's investment efficiency.

Generally, the research on CSR in Australia and New Zealand can be traced back to the early 2000s (Anderson and Landau 2006; Roper 2004). According to Zappalà and Cronin (2003), about seventy percent of the top Australian companies involved in social initiatives set up their CSR policies in 2001. Eweje and Bentley (2006) showed evidence that most companies in New Zealand have been engaged in environmental and social activities since 2003. CSR activities in both countries have certainly gained some momentum in more recent years, and companies have been building up their environmental reputations (Lim and Loosemore 2017; Truscott et al. 2009).[1]

We specifically investigate the effects of CSRs on a firm's investment efficiency by adopting the following steps: First, we investigate whether a firm's overall CSR performance is related to its investment sensitivity. Second, we extricate the two important CSR dimensions (environmental dimension and social dimension) and separately study their relations with corporate investment efficiency. Third, we concentrate on those CSR initiatives that are arguably among the costliest ones. This class of CSR program is the one most likely to reduce firm investment efficiency because they could lead to a substantial reallocation of the firm's resources to environmentally friendly projects.

We observed that, on average, companies' environmental and social policies in Australia and New Zealand, in contrast to those in the U.S., were not negatively related to capital efficiency; in other words, these policies are not necessarily value-destroying. However, when we divided our samples and concentrated on highly costly CSR initiatives, we did observe a negative impact.

Our contributions to the extant literature is threefold. First, our study aims to examine the impact of environmental policies on firm financial performance by studying an underexplored measure of financial performance, namely a firm's capital efficiency. More importantly, we consider the associated moderating effects of CSR on the sensitivity of investment to Tobin's Q; this is an effective measure of capital allocation efficiency since it reflects how a firm's current growth opportunities (Q) affect a firm's future investments. While the link between CSRs and a firm's performance has been widely investigated, this channel of moderating effect has not yet been studied, bar for the U.S. market. Second,

prior research indicates that firms' CSR policies and initiatives largely contain county and regional differences (Baughn et al. 2007). They have a strong relationship with the regional economy and the political and social context. We add to the literature by investigating our fundamental research question in two countries with different institutional, governance, and financial structures than those of the U.S. We do observe that firms' CSR policies and their implementation in Australia and New Zealand, as opposed to the U.S., generally do not lead to poor financial outcomes. Finally, by constructing a new index of costly environmental and social aspects of CSR initiatives (e.g., emission reduction, employee health and safety improvements, clean energy products) for the first time in the literature, we show that they could reduce a firm's investment efficiency.

The rest of our paper is structured as follows. In the next section, we provide a brief overview of the relevant literature as well as a discussion on the CSR scoring systems. Then, we present our research design containing the hypothesis, methodology, and sample. Next, we present our empirical findings. In the following section, we provide some discussions and the implications of our paper. The final section is our conclusion.

2. Literature Review

The relationship between CSR initiatives and financial performance can be tracked back to two fundamental theories: the shareholder theory and the stakeholder theory (Eldar 2014).

The shareholder theory contends that managers are obliged to act in the best interest of shareholders to maximize their wealth, because shareholders are the ultimate owners of the company and are residual claimants after all other stakeholders are paid (Shleifer and Vishny 1997). Friedman (1970) argued that CSR is a "mere means to wealth creation for shareholders". As a result, when CSR initiatives are not consistent with shareholder wealth creation, they are not acceptable (Mackey et al. 2007; McWilliams and Siegel 2001).

The stakeholder theory (Freeman and Reed 1983) addresses wider issues facing corporate managers, including social, environmental, and community issues in an organization. In the spirit of the stakeholder theory, prior research (Garriga and Melé 2004; Kim et al. 2012) has developed ethical, intercreative, and political theories of CSR. These theories extend the traditional managerial theory and provide more specific directions as to how managers need to fulfil their obligations and align the interest of various stakeholders.

Based on these two fundamental theories, previous studies have produced mixed empirical findings regarding the impact of CSR plans on firm performance. Margolis and Walsh (2003), reviewing over 120 studies between 1971 and 2001, found the link between CSR activities and financial performance to be mixed. By conducting a meta-analysis, Margolis et al. (2007) showed that some research documented a negative effect of CSR on corporate financial performance, while others suggested a positive effect. The overall effect of all these studies is approximately zero and statistically insignificant. As such, rather than studying the overall impact of CSR on a firm's overall financial performance, more recent studies have started investigating this topic from specific points of view. For example, McLean et al. (2012) and Bhandari and Javakhadze (2017), using Tobin's Q theory and employing an investment efficiency framework, indicated that investing in CSR schemes could reduce firm-level investment sensitivity to Q, and that investments in CSR projects distorted a firm's capital allocation efficiency. They argued that because a firm's resources are limited and some CSR activities are costly (Lin and Mills 2001; Muslu 2004), managers have to forego profitable investments. An earlier study by Preston and O'Bannon (1997) proposed a trade-off hypothesis, where a high level of CSR activities is associated with a low level of a firm's financial performance. More specifically, by over-investing and using its limited resources in CSR activities, a company could drain off its capital or other resources. If profitable investment opportunities appear, the company may not have enough resources to invest in those projects and may miss a growth opportunity. This also violates the core idea of neoclassical investment theory and will put the company at a disadvantage. If a firm is financially constrained, it will be difficult for the firm to invest in new capital, conduct

research and development (R&D), or make acquisitions (Rauh 2006). From the shareholder theory point of view, managers should do their best to maximize shareholder wealth (Shleifer and Vishny 1997). If managers concentrate on time-consuming CSR obligations, they may lose their focus on their main managerial responsibilities (Jensen 2010), which is therefore ultimately not helpful for their shareholders.

To study CSR-related topics more efficiently, it is also important to have a better understanding of the definitions and concepts of CSR and how they are measured. According to Ferri and Liu (2005), the emergence of Environmental, Social, and Governance (ESG) ratings is basically due to the growth of regulation on their disclosure requirements. Schäfer (2005) argued that ESG rating agencies are the link between companies and stakeholders. As ESG ratings play an increasingly significant role in firm valuation (Crifo et al. 2015), research on ESG ratings and rating agencies has become much more widespread. By studying six different sustainability indices and ten ESG rating agencies, Escrig-Olmedo et al. (2010) suggested that the criteria and methods of their scoring are different, such that the ESG scores from various agencies do not correspond with each other. Since many CSR-related studies are highly dependent on ESG data, an understanding of ESG data and the quality of the data are important. This may also explain why the studies using different ESG data have produced divergent results. However, an ESG rating is still an important indicator that is widely used in CSR-related studies because in most cases, it explains the overall sustainability performance of a company (Escrig-Olmedo et al. 2010).

As a company's CSR policies may have different aspects, many ESG rating agencies also provide correspondingly more specific scores. For example, the Thomson Reuters Asset4 Database, which is used in the current study, divides the environmental dimensions into three main categories: resource use, emissions, and environmental protection-related interventions. The social dimension includes four categories: workforce, human rights, community, and product responsibility. Within each category there are also many different indicators (Reuters 2012). The widely accepted concept of CSR mainly includes two fundamental dimensions: the environmental dimension and the social dimension (Capelle-Blancard and Petit 2015; Van Marrewijk 2003). In each CSR dimension, there are also many separate CSR categories and aspects. The companies' CSR policy settings are often based on these specific categories and aspects (Escrig-Olmedo et al. 2010).

Investors and companies evaluate the sustainability of a business by the performance of these ESG pillars. In this study, following extant research, we concentrate on the two important dimensions, environmental and social, of the ESG rating (e.g., Bhandari and Javakhadze 2017; Mackey et al. 2007).[2] Moreover, there are a number of studies which show that some of the specific CSR aspects can be very costly and significantly affect a firm's financial performance, such as emissions reduction (Muslu 2004) and employee health and safety (Lin and Mills 2001). We will also set up a separate index of these costly CSR plans and will investigate their impact on a firm's performance.

3. Research Design

This section presents the main steps and details of our study, including the hypothesis development, empirical models, the measurements of the main variables, and data and sample.

3.1. Hypothesis Development

Based on the theories and findings mentioned in the previous sections, here, we construct our main hypothesis and provide some explanations on how the hypothesis is developed. Prior research has developed the relationship between the rate of corporate investment and marginal Q (e.g., Hayashi 1982; Tobin 1969; Yoshikawa 1980).[3] This relationship could, however, be influenced by a third factor (e.g., Bhandari and Javakhadze 2017; McLean et al. 2012), which in our case is CSR investments. Following the idea of Bhandari and Javakhadze (2017), we investigate the effects of CSR activities by Australian and New Zealand firms on their investment allocation efficiency.

The main hypothesis of this paper is developed next. It could be argued that CSR projects may reduce a company's investment sensitivity in the following ways. First, if a company uses its resources to implement CSR activities, then these will reduce the company's overall resources (Preston and O'Bannon 1997) for other investment purposes. As such, once a company encounters a profitable investment opportunity, which is represented by Q, its sensitivity to the investment opportunity will be reduced. In other words, a company's social and environmental achievement could be at the cost of its investment efficiency. Second, the CSR activities may consume managers' time and effort, leading to their focus deviating from their main managerial responsibilities (Jensen 2010), and the managers potentially missing out on profitable investment opportunities. Third, given the potential conflict between the shareholder theory and the stakeholder theory (Smith 2003), it would be difficult to meet the needs of stakeholders and shareholders at the same time. If a company focuses on various stakeholders' needs, it may have to abandon certain profitable investment opportunities that are solely beneficial to shareholders. Based on the idea of the neoclassical theory of investment and a firm's optimization behavior, a company should invest in the projects that maximize their net present value. As the purpose of the CSR initiatives is not necessarily to maximize a company's present net value, investing in the CSR projects may contradict the idea of the neoclassical theory of investment. Therefore, CSR activities may reduce a company's investment sensitivity to Q. Thus, our main hypothesis in this paper is as follows:

Hypothesis 1 (H1). *CSR activities will reduce a company's investment sensitivity to Q.*

3.2. Empirical Model

The empirical framework of this research follows the study by Bhandari and Javakhadze (2017). The details of this framework are as described below:

$$INV_{i,\,t} = \beta_0 + \beta_1 Q_{i,\,t-1} + \beta_2 ESG_{i,\,t-1} + \beta_3 Q_{i,\,t-1} ESG_{i,\,t-1} + \text{Control Variables} + \text{Year Dummies} + \text{Firm Dummies/Industry Dummies} + \text{Country Dummies} + \varepsilon_{i,t}$$

where INV is the corporate investment rate. Q represents a company's growth opportunity. ESG measures a company's CSR. The Control Variables are the internally generated cash flow, CF; the interaction term of CF and ESG; the price to book value ratio, PTBV; the firm's leverage ratio, LEVERAGE; the firm size, SIZE; and the firm age, AGE. To investigate how the result could be affected by the year fixed effect, firm fixed effect, industry fixed effect, and country fixed effect, the Year Dummy, the Firm Dummy, the Industry Dummy, and the Country Dummy are added to the model accordingly.

The key variable in this study is the interaction term of Q and ESG. As the hypothesis of this research is that the CSR projects reduce a company's investment sensitivity to Q, the coefficient of this interaction term on investment is expected to be negative, that is, $\beta_3 < 0$. This is because the investment sensitivity to Q is represented by the coefficient of Q on investment. From the equation above, the coefficient of Q on investment is equal to $\beta_1 + \beta_3 * ESG$ ($ESG \neq 0$). Only when $\beta_3 < 0$ can we say that this coefficient will decrease when the ESG increases. Hence, it could be concluded that CSR activities reduce investment sensitivity to Q.

3.3. Measurement of Variables

First, the corporate investment rate, INV, is computed as the capital expenditure scaled by the lagged book value of total assets. It is used in the main part of the empirical research. The main independent variables are computed as follows. The variable ESG in this research measures a company's CSR score. In the first stage, we use an equal-weighted score of environmental and social scores to measure the overall CSR initiatives. Next, we use the environmental score and social score separately to measure the two main dimensions (Ng and Rezaee 2015) of CSR. All the scores are from the Asset4 ESG database.

Previous literature shows evidence that some of the environmental and social initiatives or policies are essentially costly for a company; examples of these are emission reduction (Muslu 2004), employee health and safety (Lin and Mills 2001), product innovation (Kessler

2000), and customer relationship improvement (Berrone et al. 2007). In this case, these costly CSR activities may consume more corporate resources and capital, thus they are more likely to have an impact on the company's investment efficiency. In the second part of our analysis, some essentially costly CSR indicator scores have been selected accordingly. Combining these indicators, we created a new CSR indicator called COSIND. The COSIND is essentially designed to represent those costly CSR initiatives or policies. It is computed as:

$$COSIND = (DM\_ENERO24S + DM\_SOHSD04S + DM\_ENPIO07S + DM\_SOPRO11S)/4$$

where DM_ENERO24S is the score of environmental expenditure on emission reduction minus the mean score in the corresponding industry, while DM_SOHSD04S is the score of employee health and safety improvements minus the mean score in the corresponding industry.[4] Similarly, DM_ENPIO07S is the score of the product innovation/renewable/clean energy product minus the mean score in the corresponding industry. Finally, DM_SOPRO11S is the score of product responsibility/customer controversies minus the mean score in the corresponding industry.[5]

The measurement of Q follows the studies of Baker et al. (2003); Bhandari and Javakhadze (2017); and Rauh (2006). It is computed as the market value of equity, minus the book value of equity, plus the book value of assets; all divided by the book value of assets.

The control variables include CF (cash flow), PTBV (the de-meaned value of a company's price to book value ratio), LEVERAGE (leverage ratio), SIZE (firm size), and AGE (firm age). The prior literature (e.g., Fazzari et al. 1988; Hubbard 1997) shows that when companies face financial constraint, their investment will be more sensitive to internally generated cash flow. The control variable CF (cash flow) is estimated as the "net income before extraordinary item plus depreciation and amortization expenses plus R&D expenses, all scaled by the book value of total assets". According to Baker et al. (2003), companies invest more when their stock is overvalued. To control for the overvaluation, the PTBV is calculated as a company's price to book value ratio minus the mean ratio in the corresponding industry. A higher leverage ratio is generally associated with a lower investment (Aivazian et al. 2005); LEVERAGE is the company's total debt divided by its total assets. Prior research shows that there is also a relationship between investment and firm size (Kadapakkam et al. 1998), where SIZE is the natural logarithm of a company's total assets. AGE has been defined as the firm's age since its incorporation.

3.4. Data and Sample

The data used in this research were collected from different datasets. More specifically, companies' financial information was from Thomson Reuters DataStream database; CSR-related information (e.g., ESG ratings and CSR indicators) was from the Thomson Reuters Asset4 database. The data frequency is yearly. The initial sample was constructed using all Australian and New Zealand listed firms (both currently listed and de-listed ones). The initial sample was subjected to the following restrictions: First, we required non-missing observations for the main variables; second, the company's book value of assets, capital, and sales had to be at least $ 1 million in their local currency (AUD or NZD); third, those companies with a data period of less than 3 years were eliminated; finally, all variables were winsorized at 0.5 and 99.5 percentiles. The final sample was an unbalanced panel with 3324 firm-year observations from 2004 to 2017.

Table 1—Panel A shows the sample distribution by year; Panel B reports the sample distribution by country; Panel C reports the sample distribution by industry; and Panel D is the descriptive statistic of the main variables. INV is the main dependent variable representing the firm's investment ratio. As discussed earlier, we also used two components of the overall ESG score so that the impact of CSR could be studied at different levels. ENV is the environmental score, and SOC is the social score. According to Reuters (2012), the environmental dimension includes three main categories: emissions, resource use, and innovation; the social dimension includes four main categories: human rights, community, product responsibility, and workforce. In total, there are approximately 138 score-based

CSR indicators available in the Assets4 dataset for companies in Australia and New Zealand. These 138 CSR indicator scores rank between zero and one hundred. The variable COSIND is specifically set up and is computed using several more costly CSR indicators.

Table 1. Sample descriptive statistic.

Panel A: Sample Distribution by Year.

Year	Freq.	Percent	Cum.
2004	65	1.96	1.96
2005	82	2.47	4.42
2006	90	2.71	7.13
2007	96	2.89	10.02
2008	104	3.13	13.15
2009	191	5.75	18.89
2010	269	8.09	26.99
2011	297	8.94	35.92
2012	314	9.45	45.37
2013	349	10.5	55.87
2014	355	10.68	66.55
2015	386	11.61	78.16
2016	374	11.25	89.41
2017	352	10.59	100
Total	3324	100	

Panel B: Sample Distribution by Country.

Country	Freq.	Percent	Cum.
Australia	3108	93.5	93.5
New Zealand	216	6.5	100
Total	3324	100	

Panel C: Sample Distribution by Industry Sector.

Industry	Freq.	Percent	Cum.
Communication Services	55	1.65	1.65
Consumer Discretionary	530	15.94	17.6
Consumer Staples	207	6.23	23.83
Energy	261	7.85	31.68
Financials	270	8.12	39.8
Health Care	201	6.05	45.85
Industrials	355	10.68	56.53
Information Technology	94	2.83	59.36
Materials	964	29	88.36
Real Estate	250	7.52	95.88
Utilities	137	4.12	100
Total	3324	100	

Panel D: Descriptive Statistics of the Main Variables.

Variables	N	Mean	S.D.	P25	P50	P75
INV1	3324	8.601	14.53	1.213	4.051	9.32
ESG	3324	38.86	25.67	16.85	31.33	57.81
ENV	3324	37.55	27.43	14.37	25.68	57.82
SOC	3324	40.17	27.39	15.57	33.88	62.23
COSIND	3324	−0.931	9.859	−8.661	−2.31	3.314
Q	3324	1.909	1.771	1.013	1.324	2.053
CF	3324	0.0401	0.227	0.00976	0.0677	0.125
PTBV	3324	23.43	143.5	−5.018	−1.391	1.437
AGE	3324	21.4	10.59	14	20	26
SIZE	3324	14.05	1.933	12.69	13.92	15.24
LEVERAGE	3324	0.219	0.196	0.055	0.209	0.321

Table 1—Panel A shows that the number of observations increases over the years. This pattern could be explained by the increase of CSR-related data in our sample. The concept of CSR, as discussed earlier, began in Australia and New Zealand in the early 2000s (Anderson and Landau 2006; Roper 2004), which was when companies in these two countries began to disclose CSR policies. Therefore, there are fewer observations from the earlier years. Our sample-year distribution is consistent with prior studies such as that of Bhandari and Javakhadze (2017), where the number of observations in the most recent year is approximately six times the number in the initial year.

In the sample distribution by country (Table 1, Panel B), we notice that almost 94% of the observations are from Australia. This is not surprising given that the relative stock market size in Australia is much larger than in New Zealand. The industry classification in this research follows the Global Industry Classification Standard (GICS). Table 1—Panel C outlines our two-digit GICS sector code-based sample distribution by industry.

4. Empirical Results

The empirical results are presented in three steps. First, the overall ESG scores are used in the empirical model to study the effect of the CSR on a firm's investment efficiency. Second, the two main CSR dimensions' scores will be tested separately to investigate their respective effects. Finally, a new index that represents the essentially costly CSR activities, COSIND, will be used to study how they could affect a firm's investment efficiency.

4.1. The Effect of Overall CSR on Investment Efficiency

Table 2 shows the effect of overall CSR initiative on investment efficiency. The results are presented in six columns which correspond to the six different models employed. The dependent variable is the corporate investment ratio, INV. The regression outputs in column (1) are without any fixed effect. The regression outputs in column (2) were estimated by a year fixed effect only. The results in column (3) were estimated with a year fixed effect and an industry fixed effect. Column (4) shows the results with year fixed and firm fixed effects. The regression outputs in column (5) were estimated with a year fixed effect, an industry fixed effect, and a country fixed effect. Finally, column (6) presents the results estimated with the year fixed effect, firm fixed effect, and country fixed effect.

Models (1)–(6) indicate that no statistically significant impact from overall ESG performance was observed on a firm's investment sensitivity to Q, and that the coefficient of the interaction term Q*ESG is not statistically significant. Our results clearly indicate that the overall ESG performance does not significantly affect a firm's investment efficiency. Our findings are in contrast to those of Bhandari and Javakhadze (2017), which documented a significantly negative impact for the U.S. firms. Moreover, the interaction term of CF and ESG is positively significant in four of the six models. It can be argued that ESG performance affects corporate investment by increasing its investment sensitivity to internally generated cash flow. If a company spends more money on the CSR activities, its investment will rely more on its internally generated cash (Bhandari and Javakhadze 2017). With regards to the coefficient estimates of ESG in row 2 for models (3) and (5), they are negatively significant. These findings are because the corporate investment rate INV mainly measures the physical investment, but the CSR initiatives are associated with the intangible assets (Hur et al. 2014). If a company invests in CSR initiatives, it may reduce its investment in physical assets. Therefore, within the same industry (column (3) and column (5)), the marginal effect of ESG on corporate investment is negative. The positive coefficient estimates of Q are observed in models (4) and (6), which indicate that the marginal effect of Tobin's Q on corporate investment is positive. This finding is consistent with the previous research (e.g., Bolton et al. 2011). In models (4) and (6), we found a significantly negative coefficient of firm leverage on investment. This shows that leverage has a negative effect on firms' investment level (Dang 2011). Another control variable, firm size, has a significant negative impact on corporate investment rate in all of our six models. In line with Huynh and Petrunia (2010), there is a negative conditional relationship between firm

growth and firm size. Our results show that larger firms grow at a slower speed, resulting in a lower level of corporate investment rate.

Table 2. The overall ESG performance and investment efficiency.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**INV**	**INV**	**INV**	**INV**	**INV**	**INV**
Q	0.655	0.522	0.880	1.616 **	0.881	1.616 **
	(0.579)	(0.573)	(0.558)	(0.749)	(0.558)	(0.749)
ESG	−0.0276	−0.0185	−0.0685 ***	−0.0392	−0.0686 ***	−0.0392
	(0.0232)	(0.0228)	(0.0241)	(0.0271)	(0.0241)	(0.0271)
Q*ESG	−0.000815	0.00379	0.0127	0.0185	0.0126	0.0185
	(0.0162)	(0.0158)	(0.0149)	(0.0175)	(0.0148)	(0.0175)
CF	−8.846 **	−8.546 *	−3.105	−4.305	−3.095	−4.305
	(4.470)	(4.461)	(4.399)	(4.421)	(4.406)	(4.421)
CF*ESG	0.352 ***	0.315 ***	0.188 *	0.144	0.188 *	0.144
	(0.112)	(0.112)	(0.109)	(0.117)	(0.109)	(0.117)
PTBV	−0.00211	−0.000436	0.00177	−0.000160	0.00177	−0.000160
	(0.00225)	(0.00235)	(0.00176)	(0.00103)	(0.00176)	(0.00103)
LEVERAGE	1.260	1.159	2.897	−6.087 *	2.906	−6.087 *
	(2.429)	(2.455)	(2.280)	(3.578)	(2.284)	(3.578)
SIZE	−1.591 ***	−1.729 ***	−0.736 **	−2.543 **	−0.734 **	−2.543 **
	(0.283)	(0.287)	(0.297)	(1.238)	(0.296)	(1.238)
AGE	0.104 ***	0.0791 **	0.0228	0.295	0.0223	0.295
	(0.0397)	(0.0399)	(0.0360)	(1.591)	(0.0361)	(1.591)
Constant	27.26 ***	27.15 ***	17.70 ***	34.14	17.78 ***	34.14
	(3.845)	(3.837)	(4.335)	(21.93)	(4.372)	(21.93)
Observations	2854	2854	2854	2854	2854	2854
R-squared	0.085	0.101	0.214	0.648	0.214	0.648
Year FE	NO	YES	YES	YES	YES	YES
Industry FE	NO	NO	YES	NO	YES	NO
Firm FE	NO	NO	NO	YES	NO	YES
Country FE	NO	NO	NO	NO	YES	YES
Adjusted R-squared	0.0818	0.0948	0.205	0.578	0.205	0.578

Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.2. The Effects of Two CSR Dimensions on Investment Efficiency

In the second step, we tested the effects of the environmental and social dimensions of CSR separately as it could be argued that these two dimensions of CSR may affect a firm's investment efficiency differently. For example, a higher environmental achievement may be very expensive for a company (Palmer et al. 1995), while a higher social achievement may not be that expensive or may even financially benefit the business (Hong and Kacperczyk 2009). In this case, it is necessary to test these two dimensions separately to study their influence on the investment efficiency of a firm.

4.2.1. The Effect of Total Environmental Performance on Investment Efficiency

The results for the impact of the total environmental score, *ENV*, on a firm's investment efficiency are presented in Table 3.

In general, it can be observed that our results remain unchanged and are generally comparable to the overall ESG scores. In Table 3, the interaction term Q*ENV does not have a significant coefficient in any of the six models. There is no evidence that corporate investment efficiency is affected by total environmental performance. In rows 4 and 5, column (1) and column (2), the combined coefficient estimates—the marginal effect of cashflow on corporate investment is negative. That is, corporate environmental performance increases the impact of cashflow on corporate investment, increasing a firm's investment sensitivity to cashflow. This is consistent with findings by Bhandari and Javakhadze (2017) in that when firms use their limited resources in CSR-related projects, their corporate investment

will rely more on their internally generated cash. The positive coefficient estimates of Q on INV in models (4) and (6) imply a positive marginal effect of Tobin's Q on the corporate investment rate. In row 2, columns (1), (3), and (5), we observe a significant negative coefficient of total ENV, suggesting that the marginal effect of corporate environmental performance on corporate investment is negative. Leverage (columns 5 and 6) and firm size (all six columns) still negatively affect corporate investment.

Table 3. Total environmental performance and investment efficiency.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**INV**	**INV**	**INV**	**INV**	**INV**	**INV**
Q	0.366	0.234	0.769	1.554 **	0.769	1.554 **
	(0.581)	(0.573)	(0.564)	(0.758)	(0.564)	(0.758)
ENV	−0.0396 *	−0.0375	−0.0699 ***	−0.0331	−0.0699 ***	−0.0331
	(0.0233)	(0.0238)	(0.0230)	(0.0240)	(0.0230)	(0.0240)
Q*ENV	0.0161	0.0210	0.0201	0.0240	0.0201	0.0240
	(0.0160)	(0.0159)	(0.0149)	(0.0143)	(0.0149)	(0.0143)
CF	−7.582 *	−7.654 *	−2.321	−4.140	−2.317	−4.140
	(4.109)	(4.131)	(4.128)	(3.779)	(4.135)	(3.779)
CF*ENV	0.297 ***	0.274 ***	0.152	0.138	0.152	0.138
	(0.100)	(0.0998)	(0.103)	(0.0902)	(0.102)	(0.0902)
PTBV	−0.00224	−0.000536	0.00161	−0.000175	0.00161	−0.000175
	(0.00226)	(0.00235)	(0.00175)	(0.00104)	(0.00175)	(0.00104)
LEVERAGE	0.761	0.652	2.613	−6.332 *	2.617	−6.332 *
	(2.431)	(2.453)	(2.285)	(3.565)	(2.290)	(3.565)
SIZE	−1.633 ***	−1.726 ***	−0.777 ***	−2.541 **	−0.776 ***	−2.541 **
	(0.288)	(0.290)	(0.297)	(1.256)	(0.296)	(1.256)
AGE	0.0920 **	0.0688 *	0.0152	0.320	0.0150	0.320
	(0.0402)	(0.0405)	(0.0350)	(1.600)	(0.0352)	(1.600)
Constant	28.30 ***	27.55 ***	18.16 ***	33.16	18.19 ***	33.16
	(3.921)	(3.883)	(4.397)	(21.87)	(4.438)	(21.87)
Observations	2854	2854	2854	2854	2854	2854
R-squared	0.086	0.104	0.214	0.649	0.214	0.649
Year FE	NO	YES	YES	YES	YES	YES
Industry FE	NO	NO	YES	NO	YES	NO
Firm FE	NO	NO	NO	YES	NO	YES
Country FE	NO	NO	NO	NO	YES	YES
Adjusted R-squared	0.0833	0.0976	0.205	0.578	0.205	0.578

Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.2.2. The Effect of Total Social Performance on Investment Efficiency

The effect of total social performance, SOC, on investment efficiency are shown in Table 4.

The results from the social dimension of CSR are comparable to those from the environmental dimension. Table 4 shows that the total social performance does not significantly affect a firm's investment sensitivity to Q, as the coefficient of the interaction term Q*SOC is not statistically significant in any of the six models. The negative marginal effect of SOC on corporate investment is apparent in the models with the industry fixed effect, which presents a negative coefficient of SOC on INV1 with the industry fixed effect. The positive coefficient estimates of the interaction term CF*SOC in columns (1) and (2) suggest that corporate social performance increases corporate investment sensitivity to internally generated cash. We can also observe the negative effect of firm size.

After separately testing the effects of the environmental dimension and the social dimension of CSR, which are the results presented in Tables 3 and 4, we find that neither the total environmental dimension nor the total social dimension of CSR has a significant impact on a firm's investment efficiency. We do not find any evidence that a firm's investment sensitivity to Q is affected by the performance of all CSR dimensions. Our findings are

different from Bhandari and Javakhadze's (2017), which found that both the environmental and social dimensions of CSR negatively affected a firm's investment sensitivity to Q among the U.S. firms.

Table 4. Total social performance and investment efficiency.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**INV**	**INV**	**INV**	**INV**	**INV**	**INV**
Q	0.810	0.707	0.978 *	1.743 **	0.977 *	1.743 **
	(0.546)	(0.540)	(0.526)	(0.725)	(0.526)	(0.725)
SOC	−0.0151	−0.00342	−0.0464 **	−0.0381	−0.0467 **	−0.0381
	(0.0204)	(0.0199)	(0.0218)	(0.0307)	(0.0219)	(0.0307)
Q*SOC	−0.00790	−0.00511	0.00651	0.0117	0.00652	0.0117
	(0.0143)	(0.0139)	(0.0134)	(0.0174)	(0.0134)	(0.0174)
CF	−6.762	−6.528	−1.933	−3.069	−1.917	−3.069
	(4.148)	(4.138)	(4.072)	(4.174)	(4.080)	(4.174)
CF*SOC	0.273 ***	0.239 **	0.147	0.0987	0.147	0.0987
	(0.103)	(0.103)	(0.0973)	(0.108)	(0.0973)	(0.108)
PTBV	−0.00206	−0.000439	0.00186	-9.52×10^{-5}	0.00185	-9.52×10^{-5}
	(0.00224)	(0.00234)	(0.00176)	(0.00103)	(0.00176)	(0.00103)
LEVERAGE	1.564	1.456	3.148	−5.999 *	3.158	−5.999 *
	(2.429)	(2.462)	(2.286)	(3.614)	(2.290)	(3.614)
SIZE	−1.585 ***	−1.726 ***	−0.849 ***	−2.499 **	−0.845 ***	−2.499 **
	(0.278)	(0.282)	(0.281)	(1.236)	(0.281)	(1.236)
AGE	0.111 ***	0.0864 **	0.0204	0.213	0.0199	0.213
	(0.0396)	(0.0395)	(0.0364)	(1.545)	(0.0365)	(1.545)
Constant	26.71 ***	26.68 ***	18.88 ***	35.88 *	18.97 ***	35.88 *
	(3.819)	(3.809)	(4.194)	(20.92)	(4.232)	(20.92)
Observations	2854	2854	2854	2854	2854	2854
R-squared	0.082	0.098	0.211	0.648	0.211	0.648
Year FE	NO	YES	YES	YES	YES	YES
Industry FE	NO	NO	YES	NO	YES	NO
Firm FE	NO	NO	NO	YES	NO	YES
Country FE	NO	NO	NO	NO	YES	YES
Adjusted R-squared	0.0791	0.0914	0.203	0.577	0.202	0.577

Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.3. The Effect of the Costly CSR Initiative Policies

In this section, we carry out a more in-depth investigation on whether the more costly CSR initiatives have any impact on the capital allocation efficacy of our sample firms in Australia and New Zealand.

Table 5 shows the impact of those costly CSR activities on corporate investment efficiency. In all six models, the coefficients of Q and the coefficients of Q*COSIND are all statistically significant at different levels. Particularly, the key coefficient estimates of the interaction term Q*COSIND are significantly negative in all six models. The coefficient estimates of COSIND on INV are positive and significant in models (4) and (6), showing the positive marginal effect of Tobin's Q on the corporate investment rate. The interaction term Q*COSIND on INV is negative and significant in all six models, providing strong evidence from this view. Moreover, the coefficient estimates from SIZE are negative and significant throughout our six models. Our results in this section suggest that only those expensive CSR projects reduce a company's investment sensitivity to Q.

Table 5. The costly CSR initiatives and investment efficiency.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**INV**	**INV**	**INV**	**INV**	**INV**	**INV**
Q	−0.351	−0.341	0.393	1.442 ***	0.393	1.442 ***
	(0.358)	(0.347)	(0.320)	(0.389)	(0.321)	(0.389)
COSIND	0.206 ***	0.202 ***	0.121 *	0.0439	0.121 *	0.0439
	(0.0674)	(0.0682)	(0.0637)	(0.0705)	(0.0637)	(0.0705)
Q*COSIND	−0.184 ***	−0.173 ***	−0.117 **	−0.0793 *	−0.117 **	−0.0793 *
	(0.0527)	(0.0520)	(0.0462)	(0.0468)	(0.0462)	(0.0468)
CF	3.810	2.868	3.756	1.796	3.771	1.796
	(2.596)	(2.610)	(2.336)	(1.828)	(2.344)	(1.828)
CF*COSIND	0.115	0.0603	−0.129	0.165	−0.129	0.165
	(0.229)	(0.230)	(0.217)	(0.144)	(0.217)	(0.144)
PTBV	−0.00218	−0.000775	0.00138	0.000206	0.00138	0.000206
	(0.00219)	(0.00226)	(0.00181)	(0.000896)	(0.00180)	(0.000896)
LEVERAGE	1.476	1.384	2.929	−5.318	2.935	−5.318
	(2.133)	(2.176)	(2.049)	(3.248)	(2.052)	(3.248)
SIZE	−1.630 ***	−1.683 ***	−0.991 ***	−2.066 *	−0.990 ***	−2.066 *
	(0.261)	(0.262)	(0.257)	(1.142)	(0.256)	(1.142)
AGE	0.118 ***	0.101 ***	0.0225	−0.286	0.0221	−0.286
	(0.0391)	(0.0388)	(0.0337)	(1.474)	(0.0339)	(1.474)
Constant	27.80 ***	27.06 ***	20.73 ***	40.38 *	20.80 ***	40.38 *
	(3.702)	(3.668)	(4.098)	(20.92)	(4.141)	(20.92)
Observations	2854	2854	2854	2854	2854	2854
R-squared	0.105	0.120	0.235	0.676	0.235	0.676
Year FE	NO	YES	YES	YES	YES	YES
Industry FE	NO	NO	YES	NO	YES	NO
Firm FE	NO	NO	NO	YES	NO	YES
Country FE	NO	NO	NO	NO	YES	YES
Adjusted R-squared	0.102	0.114	0.227	0.611	0.227	0.611

Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.4. Further Analysis of the Costly CSR Indicator on the Corporate Investment Sensitivity to Q

Based on the results obtained in Table 5, this section provides further explanation of how the costly CSR indicator reduces a firm's investment sensitivity to Q. For example, in column (6) of Table 5, a firm's investment sensitivity to Q is represented by the coefficient of *Q*. According to the empirical model in our research, the coefficient of *Q* can be presented as follows:

$$\frac{\Delta INV1}{\Delta Q} = \beta_1 + \beta_3 * COSIND,$$

where β_1 = 1.442 (Table 5, column 6, row 1), β_3 = −0.0793 (Table 5, column 6, row 5), and the COSIND ranges from −8.661 to 3.314 (Table 1, Panel D).

In Table 6, we show how $\frac{\Delta INV}{\Delta Q}$ changes along with the changing of the costly CSR indicator, COSIND.

Table 6. The impact of the costly CSR indicator on investment sensitivity to Q.

	Delta-Method					
	dy/dx	**Std. Err.**	**t**	***p*** **> |t|**	**(95% Conf. Interval)**	
Q _at						
COSIND = P25	2.2646	0.6766601	3.35	0.001	0.9348485	3.594351
COSIND = P50	1.805737	0.5046107	3.58	0.000	0.8140922	2.797382
COSIND = P75	1.399401	0.5072178	2.76	0.006	0.4026326	2.396169

The values of the COSIND in Table 6 were typically selected at its 25th percentile (−8.66), the median (−2.31), and the 75th percentile (3.314). With a COSIND increasing from the 25th percentile to the 75th percentile, we can observe that the coefficient of Q on corporate investment decreases from 2.2646 to 1.3994. As a company improves its performance based on those costly CSR activities, the company's resources and assets will be more and more committed to those activities, leading such a company to manifest less sensitivity to the Q growth opportunities; hence, the company's investment efficiency is reduced. In addition, our results show no significant country differences between Australia and New Zealand, and that within the same industry, the negative effect of COSIND on investment efficiency is basically the same in the two countries.

Based on the empirical findings presented above, we do not reject the null hypothesis that CSR reduces a company's investment sensitivity to Q. The results only show that the costly CSR initiatives or policies significantly reduce a company's investment sensitivity to Q, therefore negatively affecting a company's capital allocation efficiency in Australia and New Zealand.

5. Robustness Checks

We use two alternative measures of corporate investment to check the robustness of our result. The first measure of corporate investment, INV^2, is computed as the yearly changes in property, plant, and equipment (PPE), plus the research and development (R&D) spending, all scaled by the lagged book value of assets. The alternative investment rate, INV^2, has the smaller number of observations of 770. The result (Table 7, Panel A), using the new measure, INV^2, is consistent with our hypothesis. The coefficient estimate of the interaction term of the costly CSR indicator with Q remains significantly negative in most models.

Table 7. The costly CSR initiatives and investment efficiency—robustness check.

Panel A:						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Variables	**INV^2**	**INV^2**	**INV^2**	**INV^2**	**INV^2**	**INV^2**
Q	2.071 ***	2.064 ***	1.925 ***	0.826	1.933 ***	0.826
	(0.552)	(0.562)	(0.623)	(0.780)	(0.624)	(0.780)
COSIND	0.250 *	0.285 **	0.288 **	0.0622	0.285 **	0.0622
	(0.136)	(0.138)	(0.137)	(0.149)	(0.137)	(0.149)
Q*COSIND	−0.196 *	−0.202 *	−0.203 *	−0.0636	−0.202 *	−0.0636
	(0.111)	(0.109)	(0.113)	(0.108)	(0.113)	(0.108)
CF	−0.326	−0.808	1.546	11.53	1.632	11.53
	(6.061)	(5.980)	(6.116)	(8.136)	(6.128)	(8.136)
CF*COSIND	0.436	0.420	0.415	0.115	0.400	0.115
	(0.627)	(0.626)	(0.629)	(0.621)	(0.632)	(0.621)
PTBV	−0.00548 ***	−0.00463 **	−0.00292	−0.00701 **	−0.00288	−0.00701 **
	(0.00189)	(0.00233)	(0.00253)	(0.00321)	(0.00253)	(0.00321)
LEVERAGE	−0.818	−1.086	0.614	7.044	0.665	7.044
	(3.646)	(3.502)	(3.298)	(5.896)	(3.316)	(5.896)
SIZE	−1.251 **	−1.468 **	−1.486 **	−10.24 ***	−1.467 **	−10.24 ***
	(0.533)	(0.582)	(0.610)	(3.244)	(0.606)	(3.244)
AGE	0.0851	0.0678	0.0451	−2.373 ***	0.0403	−2.373 ***
	(0.0813)	(0.0818)	(0.0738)	(0.601)	(0.0742)	(0.601)
Constant	16.70 **	18.96 **	15.44	166.9 ***	15.75 *	166.9 ***
	(7.616)	(8.324)	(9.367)	(38.00)	(9.301)	(38.00)
Observations	770	770	770	770	770	770
R-squared	0.174	0.190	0.236	0.613	0.236	0.613
Year FE	NO	YES	YES	YES	YES	YES
Industry FE	NO	NO	YES	NO	YES	NO
Firm FE	NO	NO	NO	YES	NO	YES
Country FE	NO	NO	NO	NO	YES	YES
Adjusted R-squared	0.164	0.167	0.203	0.498	0.203	0.498

Table 7. *Cont.*

Panel B: INV^3 computed by replacing the missing value with 0.						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Variables	**INV^3**	**INV^3**	**INV^3**	**INV^3**	**INV^3**	**INV^3**
Q	2.615 ***	2.570 ***	2.812 ***	3.598 ***	2.813 ***	3.598 ***
	(0.599)	(0.588)	(0.639)	(0.908)	(0.638)	(0.908)
COSIND	0.186 *	0.187 *	0.157	0.0765	0.157	0.0765
	(0.109)	(0.109)	(0.110)	(0.121)	(0.110)	(0.121)
Q*COSIND	−0.184 **	−0.174 **	−0.165 *	−0.155 *	−0.165 *	−0.155 *
	(0.0871)	(0.0856)	(0.0857)	(0.0832)	(0.0857)	(0.0832)
CF	3.141	1.622	1.988	5.531	1.920	5.531
	(2.937)	(2.925)	(2.942)	(4.060)	(2.954)	(4.060)
CF*COSIND	0.0369	−0.0341	−0.111	0.116	−0.110	0.116
	(0.280)	(0.277)	(0.270)	(0.309)	(0.270)	(0.309)
PTBV	−0.00180	0.000211	0.000999	−0.000857	0.00102	−0.000857
	(0.00144)	(0.00171)	(0.00230)	(0.00224)	(0.00228)	(0.00224)
LEVERAGE	−1.714	−1.746	−1.840	−15.70 **	−1.871	−15.70 **
	(2.380)	(2.364)	(2.332)	(6.926)	(2.334)	(6.926)
SIZE	−0.215	−0.292	0.223	−7.752 ***	0.217	−7.752 ***
	(0.254)	(0.267)	(0.292)	(1.663)	(0.292)	(1.663)
AGE	0.00834	−0.0208	−0.0636	14.89 ***	−0.0618	14.89 ***
	(0.0398)	(0.0391)	(0.0400)	(1.986)	(0.0403)	(1.986)
Constant	1.994	1.340	−4.966	−229.3 ***	−5.283	−229.3 ***
	(3.835)	(4.023)	(6.751)	(33.79)	(6.834)	(33.79)
Observations	2852	2852	2852	2852	2852	2852
R-squared	0.101	0.117	0.129	0.406	0.129	0.406
Year FE	NO	YES	YES	YES	YES	YES
Industry FE	NO	NO	YES	NO	YES	NO
Firm FE	NO	NO	NO	YES	NO	YES
Country FE	NO	NO	NO	NO	YES	YES
Adjusted R-squared	0.0983	0.111	0.119	0.287	0.119	0.287

Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7—Panel A shows the results with an alternative measure of the corporate investment rate. The coefficient estimates of Q on INV (row 1) and Q*COSIND (row 3) indicating the marginal effect of Tobin's Q on corporate investment are positive and significant in most of the models. The costly CSR initiatives reduce the overall impact of Tobin's Q on corporate investment. The industry-adjusted price-to-book value ratio (PTBV) negatively affects corporate investment. The firm size is still negatively associated with corporate investment.

Our second measure of firm investment, V^3, is computed by replacing the missing R&D data with 0. This is because the R&D data contain many missing values for our sample firms. This measurement of investment ratio follows the method of McLean et al. (2012). The INV^3 variable now contains 2852 observations. Based on results reported in Panel B, Table 5, the coefficient estimates of the key interaction term, Q*COSIND, remain significantly negative in all six models. The coefficients of Q are positive and significant in all six models. The coefficient estimates of the interaction term, Q*COSIND, remain significantly negative in all six models. These results further support the negative impact of costly CSR initiatives on corporate investment efficiency. The negative coefficients of Leverage and Size on INV in models (4) and (6) show the negative effects of leverage and firm size on corporate investment.

Overall, both panel A and panel B of Table 7 show results consistent with our main findings, which implies further support for the robustness of our findings.

6. Discussions and Implications

We studied the effects of CSR on investment efficiency based on a comprehensive sample of Australian New Zealand firms. Interestingly, our empirical findings are different from the findings of a previous study in the U.S. (Bhandari and Javakhadze 2017). While that study observed that the overall ESG performance, the environmental dimension performance, and the social dimension all significantly reduce firm-level investment efficiency, we found that in Australia and New Zealand, companies' environmental and social policies are not value-destroying. In fact, some of the environmental and social practices may add value to the companies. Prior research suggests that investors, banks, and institutions care about companies' environmental and social performance (e.g., Chava 2014). More specifically, through better environmental and social performance, companies can lower their cost of equity capital, i.e., external financing will be cheaper and easier for them. Banks tend to offer loans with more favorable conditions, including lower interest rates, to those companies with better environmental and social performance, which then allows for a lower cost of debt capital. Therefore, to some extent, environmental and social projects adopted by firms in Australia and New Zealand will add value to them and, as we found, are appreciated by investors.

As for the difference between our study and that of (Bhandari and Javakhadze 2017), we can attribute this to the use of two different ESG ratings and that the two sample sizes are different. In Bhandari and Javakhadze's (2017) research, they adopted 15,670 firm-year observations, and their sample period was about 23 years. Meanwhile, the sample size in this research was 3324 firm-year observations, and the sample period was 14 years. However, more importantly, we believe that the differences in results could have been caused by the specificity of the CSR policies or initiatives in Australia and New Zealand. Prior research indicates that firms' CSR policies and initiatives have county and regional differences (Baughn et al. 2007). They have a strong relationship with the regional economy and the political and social contexts. As such, firms' CSR adaptation in Australia and New Zealand is not the same as that by U.S. companies. Based on our empirical findings, we can argue that generally, the CSR initiatives in Australia and New Zealand do not have a negative impact on firms' investment allocation efficiency, apart from the very expensive environmental initiatives.

Our findings in this study have certain implications for both managers and investors in the two sample countries. For managers, they imply that companies with moderate and responsible plans for environmental and social issues are expected to do better than their counterparts who have no plans or choose to embrace extremely costly plans. Managers cannot simply follow the idea that pursuing an environmentally responsible plan runs against the wishes of shareholders and would harm firm value. However, at the other extreme, investors penalize zealot managers that pursue highly costly initiatives at the expense of shareholders. Managers need to find a balancing act between the two forces of environmental issues and provide shareholders with adequate returns. For investors, our results, at least in Australia and New Zealand, imply that environmental issues should be a guiding principle for their investment strategies, especially in trying to find those firms that have reasonable and affordable plans that tackle social and environmental issues.

There are several directions toward which our study can be extended. We focus on the three areas below:

First, it would be worthwhile to carry out comparable studies in different countries, with great emphasis on the importance of CSRs, in order to observe if our empirical results hold or not. Likewise, a similar analysis can be conducted by focusing on the industry level where different industries are subject to different CSR requirements and policies.

Second, a further analysis could be directed toward the components of our costly environmental index, COSIND. More specifically, two of these initiatives (emission reduction and employee health and safety) are related to satisfying regulation and avoiding liability that could be considered as costs. Alternatively, the other two (product innovation and customer relationship) are related to improving product quality and enhancing cus-

tomer satisfaction that could be considered as investments. Thus, different types of costly initiatives could have potentially different impacts on capital investment efficiency.

Third, in addition to the sensitivity of capital allocation, there are a number of other channels where the impact of CSR on firm performance could be investigated. At the firm level, one can point to corporate governance. At the investor level, one can look at the impact of institutional investors.

7. Conclusions

In this research, we investigated whether a company's CSR initiatives could affect its capital allocation efficiency in Australia and New Zealand. More specifically, we tested how CSR affects a company's investment sensitivity to Q. We found that the firms' capital allocation efficiency is not negatively affected by the overall ESG performance, the total environmental performance, or the total social performance. However, there was strong evidence that only the very costly CSR initiatives or policies (e.g., emission reduction, employee health and safety improvements, clean energy product, customer relationship) could reduce a company's investment efficiency.

Author Contributions: Conceptualization, A.G., A.T.-R. and S.X.; methodology, A.G., A.T.-R., S.X.; validation, A.G. and S.X.; formal analysis, A.G., A.T.-R., and S.X.; investigation, S.X.; data curation, S.X.; writing—original draft preparation, A.G., A.T.-R., and S.X.; writing—review and editing, A.T.-R.; visualization, A.G., A.T.-R., and S.X.; supervision, A.G. and A.T.-R. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: Databases used for this study are either public or purchased by Auckland University of Technology.

Acknowledgments: We would like to thank three referees and the editor of the special issue for their constructive comments.

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

Notes

1 This research combines Australian and New Zealand firms in the same sample. Prior literature documents that the corporate culture, including ethical values, are fairly similar in Australia and New Zealand (Milton-Smith 1997). A recent study (Loosemore et al. 2018) shows that the CSR goals and practices in these two countries are relatively comprable. We will however introduce country fixed effects in some of our specifications to control for possible differences between Australian and New Zealand firms that could potentially affect our empirical findings.

2 It could be argued that other dimensions, such as governance, add benefit to a company's financial performance. However, as the literature indicates, a higher level of governance could lead to corporate investment in the profitable projects rather than CSR. Hence, if the governance score is included, the effect of CSR on corporate investment efficiency could be impacted.

3 Tobin's Q-theory of investment emphasizes a fundamental connection between financial markets and the real economy: Marginal Q—i.e., marginal value of capital—is a statistic used to describe the investment behavior of a firm (Hayashi 1982). This measure has been widely used in economics and finance literature.

4 The variable names ENERO24S, SOHSD04S, ENPIO07S, and SOPRO11S are the symbols in the Asset4 dataset.

5 It could be argued that there may be large industry differences existing in the performance of these very specific CSR initiatives. Every industry may have its own focus. For example, a company from the information technology industry may not have to concentrate too much on its emission reduction performance, while a company from the materials or industrials industries may have to. Hence, industrial differences in emission reduction performance may exist. This is the reason for removing the industry average performance.

References

Aivazian, Varouj A., Ying Ge, and Jiaping Qiu. 2005. The impact of leverage on firm investment: Canadian evidence. *Journal of Corporate Finance* 11: 277–91. [CrossRef]

Anderson, Helen, and Ingrid Landau. 2006. Corporate social responsibility in Australia: A review. *University of Melbourne Legal Studies Research* 279. [CrossRef]

Baker, Malcolm, Jeremy C. Stein, and Jeffrey Wurgler. 2003. When does the market matter? Stock prices and the investment of equity-dependent firms. *The Quarterly Journal of Economics* 118: 969–1005. [CrossRef]
Banerjee, Rajabrata, Kartick Gupta, and Priyantha Mudalige. 2019. Do environmentally sustainable practices lead to financially less constrained firms? International evidence. *International Review of Financial Analysis* 68. [CrossRef]
Baughn, C. Christopher, Nancy L. Bodie, and John C. McIntosh. 2007. Corporate social and environmental responsibility in Asian countries and other geographical regions. *Corporate Social Responsibility and Environmental Management* 14: 189–205. [CrossRef]
Berrone, Pascual, Jordi Surroca, and Josep A. Tribó. 2007. Corporate ethical identity as a determinant of firm performance: A test of the mediating role of stakeholder satisfaction. *Journal of Business Ethics* 76: 35–53. [CrossRef]
Bertrand, Marianne, Matilde Bombardini, Raymond Fisman, and Francesco Trebbi. 2020. Tax-exempt lobbying: Corporate philanthropy as a tool for political influence. *American Economic Review* 110: 2065–102. [CrossRef]
Bhandari, Avishek, and David Javakhadze. 2017. Corporate social responsibility and capital allocation efficiency. *Journal of Corporate Finance* 43: 354–77. [CrossRef]
Bhattacharya, C., Sankar Sen, and Daniel Korschun. 2008. Using corporate social responsibility to win the war for talent. *MIT Sloan Management Review* 49.
Bolton, Patrick, Hui Chen, and Heng Wang. 2011. A unified theory of Tobin's q, corporate investment, financing, and risk management. *The Journal of Finance* 66: 1545–78. [CrossRef]
Capelle-Blancard, Gunther, and Aurélien Petit. 2015. The Weighting of CSR Dimensions: One Size Does Not Fit All. *Business & Society* 56: 919–43.
Chava, Sudheer. 2014. Environmental externalities and cost of capital. *Management Science* 60: 2223–47. [CrossRef]
Crifo, Patricia, Vanina D. Forget, and Sabrina Teyssier. 2015. The price of environmental, social and governance practice disclosure: An experiment with professional private equity investors. *Journal of Corporate Finance* 30: 168–94. [CrossRef]
Dang, Viet Anh. 2011. Leverage, debt maturity and firm investment: An empirical analysis. *Journal of Business Finance & Accounting* 38: 225–58.
Dunbar, Craig, Zhichuan Frank Li, and Shi Yaqi. 2021. Corporate Social (Ir)responsibility and Firm Risk: The Role of Corporate Governance. Available online: https://ssrn.com/abstract=3791594 (accessed on 22 January 2022).
Eldar, Ofer. 2014. The law & economics of social enterprise and hybrid organizations. *Columbia Business Law Review*, 92–194.
Escrig-Olmedo, Elena, María Jesús Muñoz-Torres, and Maria Angeles Fernandez-Izquierdo. 2010. Socially responsible investing: Sustainability indices, ESG rating and information provider agencies. *International Journal of Sustainable Economy* 2: 442–61. [CrossRef]
Eweje, Gabriel, and Tim Bentley. 2006. *CSR and Staff Retention in New Zealand Companies: A Literature Review*. Working Paper Series, Palmerston North: Department of Management and International Business, Messy University.
Fazzari, Steven M., R. Glenn Hubbard, Bruce C. Petersen, Alan S. Blinder, and James M. Poterba. 1988. Financing constraints and corporate investment. *Brookings Papers on Economic Activity* 1988: 141–206. [CrossRef]
Ferri, Giovanni, and Li-gang Liu. 2005. Assessing the effort of rating agencies in emerging economies: Some empirical evidence. *European Journal of Finance* 11: 283–95. [CrossRef]
Flammer, Caroline. 2013. Corporate social responsibility and shareholder reaction: The environmental awareness of investors. *Academy of Management Journal* 56: 758–81. [CrossRef]
Freeman, R. Edward, and David L. Reed. 1983. Stockholders and stakeholders: A new perspective on corporate governance. *California Management Review* 25: 88–106. [CrossRef]
Friedman, Milton. 1970. A Friedman doctrine—The social responsibility of business is to increase its profits. *The New York Times Magazine* 13: 122–24.
Garel, Alexandre, and Arthur Petit-Romec. 2021. Investor rewards to environmental responsibility: Evidence from the COVID-19 crisis. *Journal of Corporate Finance* 68: 101948. [CrossRef]
Garriga, Elisabet, and Domènec Melé. 2004. Corporate social responsibility theories: Mapping the territory. *Journal of Business Ethics* 53: 51–71. [CrossRef]
Gneezy, Ayelet, Uri Gneezy, Leif D. Nelson, and Amber Brown. 2010. Shared social responsibility: A field experiment in pay-what-you-want pricing and charitable giving. *Science* 329: 325–27. [CrossRef]
Hayashi, Fumio. 1982. Tobin's marginal q and average q: A neoclassical interpretation. *Econometrica: Journal of the Econometric Society* 50: 213–24. [CrossRef]
Hong, Harrison, and Marcin Kacperczyk. 2009. The price of sin: The effects of social norms on markets. *Journal of Financial Economics* 93: 15–36. [CrossRef]
Hubbard, R. Glenn. 1997. Capital-market imperfections and investment. *Journal of Economic Literature* 36: 193–225.
Hur, Won-Moo, Hanna Kim, and Jeong Woo. 2014. How CSR leads to corporate brand equity: Mediating mechanisms of corporate brand credibility and reputation. *Journal of Business Ethics* 125: 75–86. [CrossRef]
Huynh, Kim P., and Robert J. Petrunia. 2010. Age effects, leverage and firm growth. *Journal of Economic Dynamics and Control* 34: 1003–13. [CrossRef]
Jensen, Michael C. 2010. Value maximization, stakeholder theory, and the corporate objective function. *Journal of Applied Corporate Finance* 22: 32–42. [CrossRef]

Kadapakkam, Palani-Rajan, P. C. Kumar, and Leigh A. Riddick. 1998. The impact of cash flows and firm size on investment: The international evidence. *Journal of Banking & Finance* 22: 293–320.
Kessler, Eric H. 2000. Tightening the belt: Methods for reducing development costs associated with new product innovation. *Journal of Engineering and Technology Management* 17: 59–92. [CrossRef]
Kim, Yongtae, Haidan Li, and Siqi Li. 2014. Corporate social responsibility and stock price crash risk. *Journal of Banking & Finance* 43: 1–13.
Kim, Yongtae, Myung Seok Park, and Benson Wier. 2012. Is earnings quality associated with corporate social responsibility? *The Accounting Review* 87: 761–96. [CrossRef]
KPMG. 2017. *The Road Ahead: The KPMG Survey of Corporate Responsibility Reporting 2017*. Amstelveen: KPMG.
Krüger, Philipp. 2015. Corporate goodness and shareholder wealth. *Journal of Financial Economics* 115: 304–29. [CrossRef]
Lim, Benson T. H., and Martin Loosemore. 2017. How socially responsible is construction business in Australia and New Zealand? *Procedia Engineering* 180: 531–40. [CrossRef]
Lin, John, and Anthony Mills. 2001. Measuring the occupational health and safety performance of construction companies in Australia. *Facilities* 19: 131–39. [CrossRef]
Linnenluecke, Martina K., Tom Smith, and Brent McKnight. 2016. Environmental finance: A research agenda for interdisciplinary finance research. *Economic Modelling* 59: 124–30. [CrossRef]
Loosemore, M., B. T. H. Lim, F. Y. Y. Ling, and H. Y. Zeng. 2018. A comparison of corporate social responsibility practices in the Singapore, Australia and New Zealand construction industries. *Journal of Cleaner Production* 190: 149–59. [CrossRef]
Mackey, Alison, Tyson B. Mackey, and Jay B. Barney. 2007. Corporate social responsibility and firm performance: Investor preferences and corporate strategies. *Academy of Management Review* 32: 817–35. [CrossRef]
Margolis, Joshua D., and James P. Walsh. 2003. Misery loves companies: Rethinking social initiatives by business. *Administrative Science Quarterly* 48: 268–305. [CrossRef]
Margolis, Joshua D., Hillary Anger Elfenbein, and James P. Walsh. 2007. Does it pay to be good? A meta-analysis and redirection of research on the relationship between corporate social responsibility and financial performance. *Ann Arbor* 1001: 41234–8109.
McLean, R. David, Tianyu Zhang, and Mengxin Zhao. 2012. Why does the law matter? Investor protection and its effects on investment, finance, and growth. *The Journal of Finance* 67: 313–50. [CrossRef]
McWilliams, Abagail, and Donald Siegel. 2001. Corporate social responsibility: A theory of the firm perspective. *Academy of Management Review* 26: 117–27. [CrossRef]
Meier, Stephan, and Lea Cassar. 2018. Stop talking about how CSR helps your bottom line. *Harvard Business Review* 31.
Milton-Smith, John. 1997. Business ethics in Australia and New Zealand. *Journal of Business Ethics* 16: 1485–97. [CrossRef]
Muslu, Mesut. 2004. Economic dispatch with environmental considerations: Tradeoff curves and emission reduction rates. *Electric Power Systems Research* 71: 153–58. [CrossRef]
Ng, Anthony C., and Zabihollah Rezaee. 2015. Business sustainability performance and cost of equity capital. *Journal of Corporate Finance* 34: 128–49. [CrossRef]
Palmer, Karen, Wallace E. Oates, and Paul R. Portney. 1995. Tightening environmental standards: The benefit-cost or the no-cost paradigm? *Journal of Economic Perspectives* 9: 119–32. [CrossRef]
Preston, Lee E., and Douglas P. O'Bannon. 1997. The corporate social-financial performance relationship: A typology and analysis. *Business & Society* 36: 419–29.
Rauh, Joshua D. 2006. Investment and financing constraints: Evidence from the funding of corporate pension plans. *The Journal of Finance* 61: 33–71. [CrossRef]
Reuters. 2012. Thomson Reuters Datastream Asset 4 ESG Content. Available online: http://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/financial/datastream-asset4-esg-fact-sheet.pdf (accessed on 22 January 2022).
Roper, Juliet. 2004. Corporate responsibility in New Zealand. *The Journal of Corporate Citizenship* 14: 22–25. [CrossRef]
Schäfer, Henry. 2005. International corporate social responsibility rating systems. *Journal of Corporate Citizenship* 20: 107–20. [CrossRef]
Shleifer, Andrei, and Robert W. Vishny. 1997. A survey of corporate governance. *The Journal of Finance* 52: 737–83. [CrossRef]
Smith, H. Jeff. 2003. The shareholders vs. stakeholders debate. *MIT Sloan Management Review* 44: 85–91.
Tobin, James. 1969. A general equilibrium approach to monetary theory. *Journal of Money, Credit and Banking* 1: 15–29. [CrossRef]
Truscott, Rachael A., Jennifer L. Bartlett, and Stephane A. Tywoniak. 2009. The reputation of the corporate social responsibility industry in Australia. *Australasian Marketing Journal (AMJ)* 17: 84–91. [CrossRef]
Van Marrewijk, M. 2003. Concepts and definitions of CSR and corporate sustainability: Between agency and communion. *Journal of Business Ethics* 44: 95–105. [CrossRef]
Yoshikawa, Hiroshi. 1980. On the "q" Theory of Investment. *The American Economic Review* 70: 739–43.
Zappalà, Gianni, and Caitlin Cronin. 2003. The contours of corporate community involvement in Australia's top companies. *Journal of Corporate Citizenship* 12: 59–73. [CrossRef]