Is Corporate Social Responsibility Value Adding? An Analysis for Australian Listed Firms

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Abstract

This study uses a sample of 325 firms and 2770 firm-year observations covering companies listed on the Australian Stock Exchange for the period 2000 to 2019 to examine the relationship between Corporate Social Responsibly (CSR), Research and development (R&D), market competition level and firm value. I use Tobin's Q to measure firm value and the Herfindahl-Hirschman index to measure market competition. I find CSR is, in general, value destructive to Australian public firms. In addition, the joint effect of CSR and R&D is negative, suggesting there is a penalty for firm's undertaking both CSR actions and innovation, or, alternatively, the investments for CSR and R&D are substitutes rather than complements. Additionally, the results do not suggest that product market competition impacts the relationship between CSR and firm value, suggesting that at least for Australian firms, CSR does not appear to bring competitive advantages. This study helps to resolve the CSR-firm value puzzle by incorporating the impact of market competition level and the joint effect of CSR and R&D, and also examines if the relationship found in the US market is consistent in Australia.

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

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Chapter 1. Introduction

Over the past two decades, Corporate Social Responsibility (CSR) has drawn a lot of researchers' attention, especially within the accounting, finance, and management disciplines (Graves and Waddock, 1994; Richardson and Welker, 2001; Linthicum et al., 2010; etc.), and continues to generate new research (Lins et al., 2017; Banerjee et al., 2019; Alam et al., 2019; etc.). While developing a consensus definition of CSR has proven challenging for researchers (McWilliams et al., 2006; Malik, 2015), this paper will follow Malik's (2015) definition of CSR as various voluntary activities taken by a firm for the interest of its wider stakeholders, including customers, suppliers, regulators, employees, investors, and communities. While the definition of CSR may be disputed by researchers, there is significant evidence that companies are increasingly aware of the need to demonstrate good CSR in their operations (Haanaes, et al., 2012).

While companies are increasingly embracing CSR, Malik (2015) suggests the relationship between CSR and firm value is the most controversial topic in CSR studies. Some scholars assert businesses "do well by doing good" (Falck and Heblich, 2007; Godfrey, 2005; Orlitzky et al., 2003), whereas others argue that CSR incurs unnecessary costs which are detrimental to shareholder wealth or the market does not reward CSR efforts (Margolis and Walsh, 2003; Vogel, 2005; Crisostomo et al, 2011), yet others find no impact (McWilliams and Siegel, 2000). There is overwhelming evidence supporting the view that CSR contributes to better firm performance (Beurden and Gossling, 2008), however there are some explanations for a negative relationship. For example (Brammer et al., 2006) suggest that it may be because the altruistic investors require lower return in exchange for a morally right feeling. This study aims to add to the literature by examining the impact of product market competition on the relationship between CSR and firm value. The effect of product market competition is overlooked by a lot of the studies when investigating whether CSR contributes to firm value. Manaktola and Jauhari (2007) find CSR creates competitive advantage in competitive industries such as the accommodation industry, while Lev et al. (2010) find CSR contributes to sales

growth especially for the businesses that sell directly to individual customers. Competition forces companies to seek competitive advantages over other firms in the same industry. If CSR creates a brand effect that makes a firm more attractive to customers, then CSR may have a greater payoff when competitive advantage is most required. Fernadez-Kranz and Santalo (2010) find evidence that higher CSR levels exist in more competitive industries. It is therefore possible that CSR has a different impact on the value of firms based on the level of competition in different industries

This paper builds on the arguments of Gupta et al. (2017), who examines the effects of R&D, which they argue creates competitive advantages for firms, and on firm value based on industry competitiveness for an international sample which includes Australian listed companies. Gupta et al. (2017) find the positive effect of R&D on Tobin's Q is not affected by competition levels in developed countries. This paper examines the joint effects of CSR, R&D, and competition on firm value, as CSR and R&D are similar in the way of creating competitive advantage (Padgett and Galan, 2010; Ho et al., 2006).

This study uses a sample of 325 firms totaling 2770 firm-year observations from Australian Stock Exchange listed companies covering period 2000 to 2019. I use Tobin's Q to measure firm value and the Herfindahl-Hirschman Index to measure market competition. I measure CSR using the Thomson Reuters ASSET4 ESG score. The ASSET4 database covers 10 main themes covering Environmental, Social and Governance issues based on a company's self-reported information. Each theme has a varying number of indicators, and the score for each theme is calculated proportionately based on the total number of indicators for that theme. I find CSR is, in general, value destructive to Australian public firms. In addition, the joint effect of CSR and R&D is negative, suggesting there is a penalty for firm's undertaking both CSR actions and innovation, or the investments for CSR and R&D are substitutes rather than complements. Additionally, the results do not suggest that product market competition impacts the relationship between CSR and firm value, suggesting that at least for Australian firms, CSR does not appear to bring competitive advantages. However, when I employ the

industry average (excluding the firm) for CSR and R&D as instrumental variables, I find a positive coefficient with CSR for firms in moderately competitive industries. The findings suggest additional analysis is required in different settings to further clarify the role of CSR on firm value.

This study contributes to the literature in the following ways. The previous studies are mostly based on US companies (Fernandez-Kranz and Santalo, 2010) or international samples (Acabado et al, 2019). This study focuses on finding some evidence to explain the relationship between CSR and firm value from Australia. Australia is different from other countries mainly because mining/basic materials industry takes a large proportion of the entire market, approximately one third of the total Australian Exchange listed companies. As a country heavily reliant on natural resources, the relationship between CSR and firm value could be more interesting to discuss. Al-Hadi et al. (2019) asserts that Sustainability and CSR performance are of great importance to Australian listed firms because they constitute core business activities. Moreover, Australia is distant from the US market geographically. Chintrakarn et al. (2017) suggest companies located geographically close to each other are likely to have similar CSR policies due to social interaction reasons. The correlation between Australia and the US market is low compared with the correlation between Europe and the US market. If the Australia market could observe consistent evidence with the US and international markets evidence, it can be argued that the association is likely present in other markets. In addition, this study considers the market competition effect and the joint effect of CSR and R&D. Although Australia has been included in some international samples, these studies have not considered market competition. As most of the companies listed on the ASX conduct business locally, competition largely driven by country level competition instead of the international competition level. Suggested by (Vandenbussche & Konings, 1998), the purpose of national competition is to reduce monopoly power, whereas international competition is a result of trade liberalization, this study focus on discussing the national competition aspect.

This paper is structured as follows. Section 2 discusses the background literature and develops the hypotheses. Section 3 presents the research design including the data and sample, the empirical methodology, and the key variables. Section 4 discusses the results and provides robustness checks. Finally, section 5 concludes the findings.

Chapter 2. Literature Review and Hypotheses Development

Whether CSR engagement is a value enhancing activity to a firm is highly debated. Friedman (1970) asserts the existence of CSR signals an agency problem within the firm. Managers as the agents for the shareholders of companies, are expected to act in the best interest of the shareholders in order to maximize their wealth. Managers spending money on social issues is a waste of shareholders money, as Friedman (1970) suggests that such spending is not a company's responsibility, nor does it enhance firm value. McWilliams et al. (2006) summarize the agency theory arguments as CSR engagement is a waste of shareholder's money that should otherwise be spent on value-adding projects or returned to shareholders. They also suggest that managers may use CSR engagement for personal benefits such as reputation or career advancement.

On the other hand, a number of theories have been offered to explain why CSR may improve firm value. The stakeholder theory by Freeman (1984) argues that CSR engagement is beneficial to the firm as well as to its stakeholders. He asserts that managers must care for the interest of the stakeholders, as they might withdraw their support for the firm if they are not fairly treated. The withdrawal of support by stakeholders could harm the business as well as the owners or shareholders. Stakeholders are defined as related parties that a company conducts business with, such as suppliers, customers, lenders, employees, and others. If a company is conducting its business in a socially unacceptable or unethically way, for example if a production business hires foreign child labor to cut cost, even if they are not breaking any laws it may result in stakeholders withholding their services or business from the firm to save their own reputation. Similarly, lenders may not issue new loans, and customers who are against child labor may not consume this product.

Following Freeman's stakeholder theory, Jones (1995) asserts the instrumental stakeholder theory that firms conducting their business in a trustworthy and cooperative fashion can result in a significant competitive advantage. Similarly, McWilliams and Siegel (2001) and Waldman et al. (2003), based on the Resource Based View (RBV) theory, assert the strategic view of CSR that firms "do well by

doing good". Introduced by Wernerfelt (1984), RBV theory addresses that a firm is a mix of heterogeneous resources that can achieve sustained competitive advantage if strategically managed. Husted and De Jesus Salazar (2006) provide 3 cases for companies to adopt CSR actions: the altruist case, the coerced egoist case, and the strategic case. The altruist case is when a company devotes itself to social issues without considering its own benefits. The coerced egoist case represents those companies who do not take any further CSR actions other than what is required under the regulations. The strategic case is when a firm takes CSR actions in the aim of making economic benefits out of it. Husted and De Jesus Salazar (2006) find that when CSR is used strategically, it is the most helpful approach for profit maximizing. They also argued that when the altruist or the coerced egoist approach of CSR is taken it is less clear that CSR will be value enhancing and therefore may explain the mixed results found in prior studies considering the relationship between CSR and firm value.

Malik (2015) argues that CSR can improve firm value through two channels, improved operating performance and reducing risk (Malik, 2015) supporting the strategic view of CSR argued by Husted and De Jesus Salazar (2006). CSR should improve operating performance by helping to build a reputation as a good corporate citizen which cares for the general welfare of the community as well as the environment. The reputation built through CSR should increase customer loyalty and help the firm distinguish its products in the market. Specifically, customers and other stakeholders such as suppliers and investors can feel that by consuming the product or conducting business with environmentally and socially concerned firms, they are also supporting the community. McWilliams and Siegel (2000) conclude that CSR can also imply better production quality such as in the food industry, as "natural" and "organic" are always deemed as good for health and with better tastes. Good reputation and differentiated production help attract and retain customers to gain market share, which in turn leads to operating performance improvement (Lev et al., 2010).

From a risk reduction point of view, Lins et al. (2017) studied an international sample during the Global Financial Crisis period, and argued CSR creates social capital and trust between a company

and its stakeholders as well as the investors, which helps the company survive when it comes to hard economic situations. Jo and Na (2012) found that CSR helps reduce information asymmetry between investors and the firm, which leads to lower cost of capital. Additionally, the long-term relationship built with stakeholders ensures easier access to financial market. Corporate risk-taking is another important risk management aspect. Because risk-taking is normally in relation to value enhancing projects that allow a firm to expand, it is directly linked to firm value enhancement. Banerjee and Gupta (2017) find supporting evidence that firm-level environmentally sustainable practices enhance the risk-taking of firms.

Based on the above discussion, I form my first hypothesis.

- H1: CSR leads to higher firm value.

McWilliams and Siegel (2000) argue that R&D is an important variable that should be included when considering the impact CSR has on firm value. A large body of work has found strong evidence that R&D has a positive relationship with firm value (Hall, 1999; Hull and Rothenberg, 2008; Bracker and Ramaya, 2011; Gupta et al., 2017). In addition, a number of studies have argued that R&D and CSR are complementary strategies firms can use to build a competitive advantage (Padgett and Galan, 2010; McWilliams and Siegel, 2000). For instance, Padgett and Galan (2010), based on the Resource Based View theory, argue that R&D is an important intangible asset that can be viewed as "technical" capital possessed by a firm that is difficult for others to imitate. The "technical" capital created by R&D thus contributes to competitive advantage which leads to superior returns. Based on the similar characteristics between R&D and CSR, Padgett and Galan (2010) investigate the relationship between R&D intensity and CSR and find it is positive. Managers engaging in CSR activities have better competency in responding to external changes, therefore they are able to facilitate more efficient product and process innovation through R&D investment (McWilliams and Siegel, 2001). At the same time, information asymmetry reduced by CSR engagement enables investors to have less

concerns over the R&D projects in the company, as the investors believe the managers are not likely to have myopic views and are less likely to be manipulating earnings (Ho et al., 2016).

However, one may also argue that CSR investment and R&D investment will both decrease firm value. Banerjee and Gupta (2017) argue both CSR and R&D should be considered as risky investments that convert tangible assets into intangible assets with no guarantee to be repaid through future benefit. To better understand the joint effect of CSR and R&D, Banerjee & Gupta (2017) included an interaction term to study the joint impact of CSR and R&D on corporate risk-taking. They find additional positive risk-taking ability from firms carrying out CSR and R&D. Based on the above discussion, I form my second hypothesis.

- H2: CSR and R&D enhance firm performance separately and jointly.

Lloret (2016) asserts sustainable practices, as a concept similar to CSR (Montiel, 2008), is central to a company's survival. Lloret (2016) argue that sustainable practices enable a firm to have stable long-term relationship with the stakeholders, which creates a strong competitive advantage over its competitors. If CSR creates a significant competitive advantage, that will help firms survive in highly competitive industries. Fisman et al. (2007) confirm that CSR activities are more likely to occur when the product market competition is more intense, and the profitability created by CSR is larger when the price competition is stronger. Fernandez-Kranz and Santalo (2010) find firms in more competitive industries have higher CSR engagement levels, which is also evidence for the strategic view of CSR. They also assert that a small advantage achieved in a competitive market can be easily translated into a larger market share.

On the other hand, the negative view of CSR (McWilliams et al., 2006; Jensen and Meckling, 1976) argue that managers may engage in CSR activities for the sake of their personal benefit, such as personal reputation or career advancement. Ho et al. (2016) suggests when the market competition level is high, managers are less likely to engage in CSR for personal benefit, because the competitive

advantage created by CSR is needed for the survival of the business. Based on the above discussion, I form my third and fourth hypotheses as below.

- H3: The value creation from CSR is greater in highly competitive industries.
- H4: The joint effects of CSR and R&D have higher impact on the firms from highly competitive industries.

Chapter 3. Research Design

3.1 Dependent variable

To examine the impact of CSR, R&D and product competition on firm value, I employ Tobin's Q to measure firm value. Tobin's Q is a ratio measuring a firm's asset's market value to its replacement value. It is a well-used proxy of firm value (see among others Montgomery and Wernerfelt, 1988; Gupta et al., 2017; Chintrakarn et al., 2017; Albuquerque et al., 2018). In this study, Tobin's Q is calculated as:

$$Tobin's\ Q = \frac{Total\ Debt + Market\ Value\ of\ Equity}{Total\ Assets}$$

Total Debt, Market Value of Equity and Total Assets are downloaded from Thompson Reuters Datastream. The numerator of the equation represents the market value of the company, while the denominator of the equation represents the replacement cost or the cost to create an identical company. A Tobin's Q less than one means the firm is cheaper to purchase than it is to recreate. A Tobin's Q greater than one means the market price of the company is higher than its replacement value (Muhammad et al., 2015).

3.2 Independent variables

3.2.1 CSR measure

I measure CSR using the Thomson Reuters ASSET4 ESG score. The ASSET4 database covers 10 main themes covering Environmental, Social and Governance issues based on a company's self-reported information. Each theme has a varying number of indicators, and the score for each theme is calculated proportionately based on the total number of indicators for that theme. Higher scores indicate better CSR performance with a minimum possible score of 0 (very poor CSR) and a maximum score of 100 (excellent CSR). (Thomson Reuters ESG Scores, 2018). ASSET4 has been extensively used in CSR studies (see among others Barnerjee & Gupta, 2017; Ghoul et al., 2017; Barnerjee et al., 2019; etc.).

3.2.2 R&D

R&D is measured as R&D spending over total assets. In my final sample of 2770 observations, only 474 observations have non-zero values. Al-Hadi et al. (2019) found a similar rate of R&D observations in a sample of 651 firm-year observations for Australian publicly listed firms from 2007 to 2013. Specifically, Al-Hadi et al. (2019) found that over 75 percent of the observations have zero R&D spending indicating that most Australian companies do not have R&D projects. U.S. based studies also show low investment is in common. In Ho et al. (2016), over 50% of a sample of 21290 firm-year observations had zero R&D spending. One explanation for this phenomenon is that some companies lack the financial resources to invest in R&D projects (Audretsch et al., 2014). Cuervo-Cazurra and Annique (2010) assert a company's decision on whether to invest in R&D projects and the frequency of it are subject to their internal and external knowledge resources. Another argument is that R&D has different level of effectiveness on firm value across industries (Ehie and Olibe, 2010).

3.2.3 Market Competition

I estimate market competition based on market competition which is commonly measured by the Herfindahl-Hirschman Index (HHI) (Fernandez-Kranz and Santalo, 2010). The HHI is calculated as $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. I calculate industry total sales by categorising all ASX listed firms into 11 industries based on their ICB 2-digit codes. I downloaded all the sales data for all ASX listed firms from Thompson Reuters Datastream. This method of calculating industry sales is also employed in Fernandez-Kranz and Santalo (2010), and Ammann et al. (2013). One criticism is that it overstates the market competition by excluding sales from unlisted companies (Ali et al., 2009). However, information on total industry sales by both public and unlisted companies is not available.

3.3 Control Variables

In this study, I employ leverage, capex intensity, ROA, and market capitalisation as control variables in my regression. (McWilliams and Siegel, 2000; Hull and Rothenberg, 2008; etc.).

I include the leverage ratio to control for a firm's capital structure. If a firm is financed with too much debt, it creates a debt overhang that affects the firm's ability to take on risk. The debt holders can restrict the firm from investing in risky projects even for projects with positive net present value. Thus, high leverage would be detrimental to firm value. (Lang et al., 1996). The debt overhang issue would also restrict the firm's ability to engage in other investment activities such as CSR and R&D. (Al-Hadi et al., 2019). Leverage is calculated by total debts over total assets.

Trueman (1986) argues the capital expenditure level of a firm signals to the market the management's confidence in the firm's future earning ability. Trueman (1986) establishes that high capital expenditure levels are linked to higher stock prices. At the same time, capital expenditure results in less resources available to be spent on R&D and CSR projects. Capex intensity is calculated by capital expenditure over total assets.

ROA (Return on Assets) measures the profitability of a company. It indicates how efficiently a firm's total assets are used to generate revenue. Chen and Chen (2011) argue that if a firm is profitable, then it can finance new projects from internal cash flows rather than having to finance externally. They prove that higher profitability is linked to higher firm value. The internal cash generating ability may also affects management's decision on investment on CSR and R&D projects, as higher available cashflows may allow the firm to invest more in CSR and R&D. ROA is calculated by net income over total assets.

Size is controlled for in most corporate finance studies (Dang et al., 2018). Gooding and Wagner III (1985) argue that the importance of firm size is due to scale economies. A large firm size is linked to better access to external financing resources (Audretsch and Elston, 2002); lower firm risks (Banerjee and Gupta, 2017); better reputation or more public awareness (Ullmann, 1985). Ullmann (1985) also

asserts large companies are more likely to be CSR intensive due to its higher public exposure. I control for firm size using market capitalisation. Dang el al. (2018) analysed three common measures of firm size: total sales, total assets, and market capitalisation. They suggest market capitalisation is forward looking and controls for the size in stock market. Market capitalisation is measured as the natural logarithm of share price multiplied by the total number of shares outstanding.

3.4 Regression Model

The model used in this study follows that employed by Ho et al. (2016) with the addition of HHI as a control variable for the market competition following Fernandez-Kranz and Santalo (2010). The regression I test is as follows:

$$Tobin's\ Q_{i,t} = \alpha + \beta_1 CSR_{i,t} + \beta_2 R\&D_{i,t} + \beta_3 HHI_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Market\ Cap_{i,t} + \beta_6 ROA_{i,t} + \beta_7 Capex\ Intensity_{i,t} \quad (1)$$

Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. R&D is R&D spending over total assets. HHI is calculated as: $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in thousand-dollar values. Capex intensity is calculated by capital expenditure over total assets.

Variables are collected yearly for each firm. After removing observations with missing data, it left me with an unbalanced panel data set covering 325 firms across 18 years (2002 – 2019). Subscripts i denotes firms; t denotes years.

3.5 Data and Sample

The sample consists of all Australian Stock Exchange listed firms from 2000 to 2019. Data is collected from Thompson Reuters Datastream for sample companies. After removing observations with missing data, the final sample consists of 2770 firm-year observations covering 325 firms. As shown in Panel A of Table 1 the largest reason why firm-years are excluded is missing CSR scores.

Panel B of Table 1 provides details on the construction of sample by year and industry based on their 1-digit Industry Classification Benchmark (ICB) code. I observe a marked increase from 2002 to 2018 in the number of firms with CSR scores. As the CSR scores are calculated based on a company's self-reported information, this increasing trend may indicate an increase in the awareness of the importance of CSR issues among Australian publicly listed firms. While mandatory CSR disclosure is not required in Australia, the Australian Stock Exchange governance guidelines introduced in 2003 recommend companies to report CSR activities as best practice (Al-Hadi et al., 2019; Corporate Governance Principles and Recommendations, 2019).

Table 1 – Sample Distribution

Panel A: Sample Selection

		Firm	Year	Observations	Balance
	Original	1808	21	37968	37968
remove	Firms with no ICB industry code	20	21	420	37548
remove	Company names with "NIL PAID"			2142	35406
remove	CSR score unavailable			32577	2829
remove	Tobin's Q unavailable			59	2770

Panel B: Distribution of firms across industry and year

Industry Classifications	Technology/ Telecommunications	Health Care	Financials/ Real Estate	Consumer Discretionary/ Consumer Staples	Industrials/ Basic Materials	Energy/Utilities	Total
2002	0	0	4	0	3	0	7
2003	0	0	4	0	3	0	7
2004	1	3	15	6	14	3	42
2005	1	3	18	8	17	3	50
2006	1	3	18	8	17	4	51
2007	1	3	18	9	19	4	54
2008	1	3	18	11	21	7	61
2009	2	6	26	21	42	18	115
2010	4	8	33	25	62	24	156
2011	4	11	34	30	72	26	177
2012	5	11	35	33	81	29	194
2013	10	15	46	42	84	32	229
2014	12	22	53	46	87	33	253
2015	13	22	58	50	89	33	265
2016	19	22	63	59	94	33	290
2017	23	22	65	61	97	35	303
2018	25	24	68	64	96	34	311
2019	18	14	47	49	60	17	205
Total	140	192	623	522	958	335	2770
Percentage	5.05%	6.93%	22.49%	18.84%	34.59%	12.10%	100.00%

Panel C: Overall composition of all ASX listed firms by industry (as at Sep 05, 2020)

Industry Classifications	Technology/ Telecommunications	Health Care	Financials/ Real Estate	Consumer Discretionary/ Consumer Staples	Industrials/ Basic Materials	Energy/Utilities	Total
No. of firms	218	171	205	249	787	1	1808
Percentage	12.07%	9.47%	11.36%	13.74%	43.51%	9.85%	100.00%
Percentage of the sample for 2019 observations	8.78%	6.83%	22.93%	23.90%	29.27%	8.29%	100.00%

Over one third of the sample observations are from Industrials and Basic Materials industries. In contrast, observations from Technology and Telecommunications industries only make up 5.05% of the final sample. Panel C of Table 1 shows the overall composition of all ASX listed firms by industry as at Sep 5th, 2020. Comparing the industry composition percentages between Panel B and Panel C, the sample has a smaller percentage in Technology/Telecommunications (5% in whole sample, 9% in sample for 2019, and 12% of the ASX) and Industrials/Basic Materials (35% in whole sample, 29% in sample for 2019 and 44% of the ASX); and a heavier weight in Financial/Real Estate industry group (22% in whole sample, 23% in sample for 2019, and 11% overall) and Consumer Discretionary/Consumer Staples (19% in whole sample, 24% in sample for 2019, and 14% overall). The differences in sample composition suggests companies from Technology/Telecommunications or Industrials/Basic Materials industries are reporting on CSR issues less frequently than other industries. Companies from Financials/Real Estate and Consumer Discretionary/Consumer Staples industries, on the other hand, are reporting more on CSR issues.

Chapter 4. Results

4.1 Descriptive Statistics

Table 2 reports the descriptive statistics for the variables after winsoring. All variables except for CSR scores and HHI are winsorised at 1% and 99% percentiles to remove the impact of outliers. CSR scores and HHI are not winsorised because the observations are relatively concentrated, and no extreme outliers are observed in the sample. R&D and Market Cap are reported in thousands of dollars ($000). Based on Table 2 we can see that most of the companies have a Tobin's Q of less than 2. However, even after winsorising we see observations up to 10.86 which means the firm's market value is more than 10 times its replacement value. The results for Tobin's Q have a mean of 1.68 and median of 1.11. They are lower compared to those in Muhammad et al. (2015), who studied 76 ASX firms from 2001 to 2010 and found a mean of 2.84 and median of 1.91. The difference could be due to my study including more companies, including smaller companies, compared to Muhammad et al. (2015).

The CSR score is normally distributed ranging from 8.12 to 95.38 with mean and median of 48.20 and 46.13, respectively. The maximum score is achieved by Stockland Stapled Units, a real estate firm, in 2016. The minimum score is achieved by Audinate, a technology company, in 2019.

Table 2 - Descriptive Statistics

The sample period is from 2002 to 2019. All variables except for CSR and HHI are winsorised at the 1st and 99th percentile values. Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. CSR is not winsorised as the values are in a small range of discrete numbers. R&D is in thousand-dollar values. HHI is calculated as: $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. HHI is not winsorised as the values fall in a small range of discrete numbers. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in thousand-dollar values. Capex intensity is calculated by capital expenditure over total assets.

	Tobin's Q	**CSR**	**R&D (in $000)**	**HHI**	**Leverage**	**ROA**	**Market Cap (in $000)**	**Capex Intensity**
Mean	1.6821	48.1410	4883	0.1842	0.1939	2.1875	6475684	0.0682
Std. Dev.	1.7984	18.0619	20332	0.1112	0.1755	18.7400	16735241	0.0873
Minimum	0.1522	8.1200	0	0.0691	0.0000	-84.2100	4001	0.0000
25th percentile	0.7426	34.0025	0	0.1086	0.0204	-0.0325	284493	0.0074
Median	1.1103	46.1250	0	0.1694	0.1774	5.1500	1022305	0.0379
75th percentile	1.8400	60.9375	0	0.2236	0.3048	10.3475	4468680	0.0888
Maximum	10.8578	95.3800	145204	0.9624	0.7548	49.2800	111000000	0.4325
Observations	2770	2770	2770	2770	2770	2770	2770	2770

Table 3 ranks the average CSR scores by Industry over the whole sample period (from 2002 to 2019). Real Estate has the highest CSR scores with a mean of 58.13. Basic Material has the lowest CSR scores with a mean of 36.38. There is a 60% difference between the 2 industries. It suggests that there are differences in CSR performance between industries.

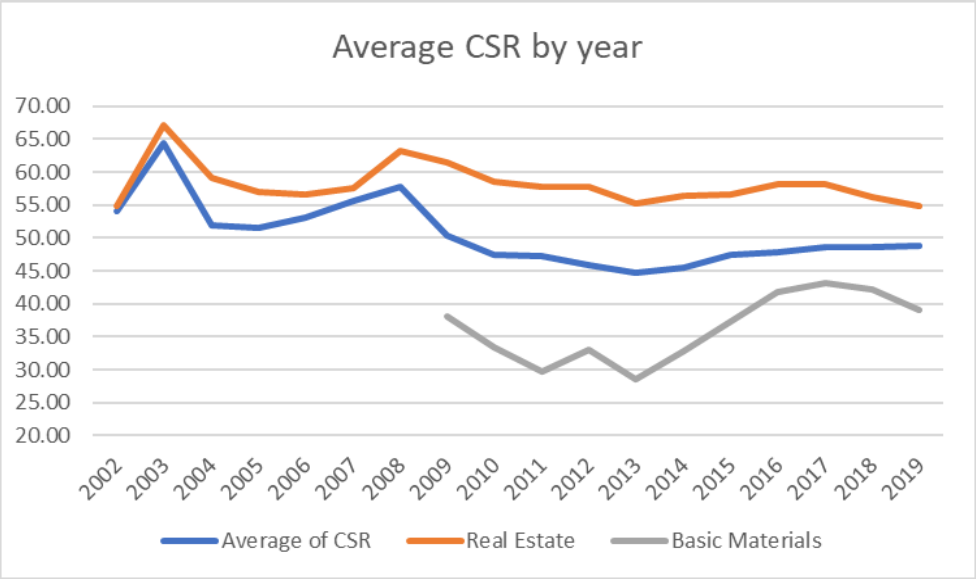
Table 3 - Mean CSR score by Industry

Mean CSR scores over the whole sample period (2002 – 2019)

Industry	Mean	Rank
Real Estate	58.13	1
Energy	54.72	2
Industrials	53.86	3
Health Care	52.16	4
Consumer Staples	51.85	5
Utilities	49.26	6
Technology	48.50	7
Consumer Discretionary	47.21	8
Financials	44.70	9
Telecommunications	44.07	10
Basic Materials	36.28	11

Figure 1 shows the trend for average CSR by year. In the earlier years (year 2002 to year 2008), the average CSR for all industries is more volatile driven by the small number of firms with CSR scores. From 2009 to 2013, the average CSR score drops to 45; it then slightly increased back to 50 following 2013. Real Estate has always had a higher CSR score compared to other industries, ranging between 55 to 60 in recent years. Basic Materials companies on average have the worst CSR scores. Although from 2013, the average CSR scores for Basic Material companies have improved almost 50% from 30 to 45, it is still well below average. From 2017 onwards, Basic Materials companies CSR scores have dropped.

Figure 1 - Average CSR by year



R&D, as shown in Table 2, has a large righthand-skew with more than 75% of the observations having a 0 value. The 15 highest R&D spending observations all belong to a single company, CSL for the years 2004 to 2018. CSL is a biotechnology company in the Health Care industry requiring considerable investment in R&D. Those companies with non-zero R&D spending have an average yearly R&D spend of close to $40 million compared with the overall mean of $4.88 million.

The market competition level, represented by HHI, ranges from 0.07 to 0.96, although 75% of the observations are under 0.22. According to the U.S. Department of Justice, an HHI less than 0.15 indicates a competitive industry; while an HHI between 0.15 and 0.25 indicates a moderately concentrated industry; and above 0.25 the industry is highly concentrated. This standard is used by Acabado et al. (2019) when analysing market competition characteristics for an international sample including Australia. My descriptive statistics for HHI suggest most of the Australian firms are operating in competitive to moderately concentrated markets. The lowest HHI (0.07) is observed in 2019 in the Consumer Discretionary industry. The highest HHI (0.96) is observed in 2014 in the Utilities industry. The average HHI is 0.184. It means on average the total sales of an Australian

company represent an 18% market share of sales within the industry. The average HHI in Australia is close to the mean of 0.191 found in Fernandez-Kranz (2010) who employ a U.S. sample.

The average leverage ratio suggests that most firms do not carry large amounts of debt. Leverage has a mean of 0.19 and median of 0.18, broadly consistent with the findings in Al-Hadi et al. (2019). The leverage ratio ranges from 0 to 0.75, meaning some Australian publicly listed firms are financed purely by equity, whereas some of them are financed with more debt than equity.

ROA (mean 2.2, median 5.2) is a lot lower than that observed in Al-Hadi et al. (2019) where the mean and median were 6.9 and 6.4, respectively. Comparing the two samples, my study includes a higher percentage of observations from Basic Materials industry in the sample compared with Al-Hadi et al. (2019) (35% vs 23% respectively). Due to the characteristics of the industry, the Basic Materials industry tends to have a lower ROA. The average ROA for Basic Materials industry is -5.23, with nearly 50% of the observations having a negative ROA.

Market capitalisation is on average $6,476 million and is normally distributed. It is quite close to the mean market capitalisation of $6,922 million in the U.S. market in 2008 and 2009 from Lins et al. (2017). Capital expenditure has a mean of 7% of total assets and median of 4% of total assets. Ho et al. (2016) studied a sample of US firms between 1995 to 2010 and observed mean capital expenditure of 5% and a median of 3%. This suggests on average, Australian companies and the U.S. companies have similar spending patterns on new fixed assets.

4.2 Correlation Matrix

Table 4 shows the correlation matrix. The highest correlation is between Market Capitalisation and CSR, which is 0.66, suggesting bigger companies have stronger CSR. Market Capitalisation is also positively correlated with R&D, Leverage, and ROA, which indicates bigger firms have more R&D spending, higher debt levels, and better profitability. The negative coefficient of -0.25 between Market Cap and Capex Intensity suggests bigger firms invest less in new capital expenditure. Coles et al. (2006) asserts Capital expenditure is considered as a safer investment as compared to the

investment in R&D. The negative correlation between Market Cap and Capex Intensity, and the positive correlation between Market Cap and R&D suggest bigger firms prefer riskier investment; or alternatively, lager firms have fewer profitable investment for capital expenditure, thus they are prepared to invest in R&D instead.

Tobin's Q has negative correlations with CSR, HHI, leverage and Capex Intensity indicating that higher leverage, greater competition, greater investment, and better CSR are associated with lower firm value. Ho et al. (2016) observed negative associations between Leverage and Tobin's Q, but positive correlations between CSR and Capex with Tobin's Q. This may indicate US investors place more value on CSR and Capex investments than Australian investors. R&D and ROA are positively associated with Tobin's Q. This is consistent with Ho et al. (2016) and Muhammad et al. (2015), meaning that more R&D investment and better profitability are associated with higher firm value. In contrast to Fernandez-Kranz and Santalo (2010), I observe a positive association between HHI and R&D, indicating companies in less competitive markets invest more in R&D projects. Capex Intensity is negatively correlated with all variables except with HHI, which is positively correlated, with a coefficient of 0.18. The positive correlation between HHI and Capex indicates that companies that have less competition pressure from peers are the ones who are spending more money on fixed assets. CSR and R&D has a negative coefficient of -0.06, which suggests that more competitive industries have better CSR engagement.

Table 4 - Correlation Matrix

The sample period is from 2002 to 2019. All variables except for CSR and HHI are winsorised at the 1st and 99th percentile values. Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. CSR is not winsorised as the values are in a small range of discrete numbers. R&D is in thousand-dollar values. HHI is calculated as: $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. HHI is not winsorised as the values fall in a small range of discrete numbers. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in thousand-dollar values. Capex intensity is calculated by capital expenditure over total assets.

Correlation	**Tobin's Q**	**CSR**	**HHI**	**R&D**	**Leverage**	**ROA**	**Capex Intensity**
CSR	-0.21						
HHI	-0.05	-0.06					
R&D	0.26	0.06	0.07				
Leverage	-0.18	0.16	0.05	-0.01			
ROA	0.11	0.14	-0.07	0.02	0.05		
Capex Intensity	-0.05	-0.21	0.18	-0.11	-0.07	-0.23	
Market Cap	0.00	0.66	0.01	0.09	0.19	0.39	-0.25

4.3 Baseline Results

To test H1, whether CSR leads to higher firm value, Table 5 reports the main regression results based on equation 1 which examines the relationship between CSR, HHI, R&D and Tobin's Q over the period 2002 to 2019. Column 1 shows a negative relationship between CSR and firm value, in contrast to my first hypothesis that CSR would increase firm value. CSR has been argued as a way for firms to create a competitive advantage. Through branding, customers and employees are expected to be loyal to firms with stronger CSR. It is also expected that CSR results in product diversification, which

contributes to competitive advantage. CSR is also argued to be helpful for reducing financial distress risk, for example the risk of social and political boycott and fines (Godfrey, 2005). However, this negative relationship is consistent across the four columns after including both industry and year fixed effects. This result suggests that higher CSR is associated with lower firm value in Australia. This is contrary to my first hypothesis. The rationale behind it could be that CSR does not generate enough loyalty among Australian customers to offset the cost of undertaking CSR projects. Another explanation could be due to the mix of industries. The competitive advantage generated by CSR may only be applicable for industries selling distinguishable products to consumers directly, thus industries such as mining and basic materials would not benefit much from CSR. Other than the reasons above, Australian investors could have a negative view on CSR. Friedman (1970) argued that CSR strategies are value destroying as they impose extra costs, while McWilliams et al. (2006) argued that managers may engage in CSR for personal reasons. Additionally, Hemingway and Maclagan (2004) suggest that CSR can be used by management as a "cover-up" strategy. If investors doubt the intentions of a firm engaging in CSR actions, the value may go down.

The coefficient for R&D is positive and significant across the four columns including after controlling for both industry and year fixed effects. This suggests that R&D investment is related to increased firm value. R&D spending is an investment in "technical" capital which helps with better product quality or results in a refined process (Padgett and Galan, 2010). R&D is also expected to help a firm by creating a competitive advantage resulting in more market share and increased firm value.

In column 1, the coefficient for HHI on firm value is -0.8, which is significant at the 1% level. We can interpret the HHI coefficient as saying that a one percent increase in market competition level (more competition) would result in a 0.8 percent increase in firm valuation. However, this result is not consistent over the 4 columns. Once year fixed effects are included, the coefficient decreases to -0.5, significant at the 5% level. After controlling for industry fixed effects, the coefficient becomes insignificant, and the inclusion of both year and industry fixed effects results in the coefficient

becoming positive and significant at the 1% level. The coefficient of 3.0694 means that a one percent increase in market competition level (more competition) would result in a decrease in firm valuation of 3 percent. The results are different from Gupta et al. (2017), as they find the coefficient of HHI is insignificant for developed countries, whereas in the developing countries the coefficient is negative.

Table 5 - Baseline Results

This table reports the regression results based on $Tobin's\ Q_{i,t} = \alpha + \beta_1 CSR_{i,t} + \beta_2 R\&D_{i,t} + \beta_3 HHI_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Market\ Cap_{i,t} + \beta_6 ROA_{i,t} + \beta_7 Capex\ Intensity_{i,t}$. The sample period is from 2002 to 2019. All variables except for CSR and HHI are winsorised at the 1st and 99th percentile values. Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. CSR is not winsorised as the values are in a small range of discrete numbers. R&D is R&D spending over total assets. HHI is calculated as: $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. HHI is not winsorised as the values fall in a small range of discrete numbers. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in natural logarithm form. Capex intensity is calculated by capital expenditure over total assets. T-Statistics are presented in the brackets below the coefficient estimates. * indicates significant at 10%, ** indicates significant at 5% and *** indicates significant at 1%. Model 1 presents results without controlling for year fixed effects or industry fixed effects. Model 2 presents results controlling for year fixed effects. Model 3 presents results controlling for industry fixed effects. Model 4 presents results controlling for both year fixed effects and industry fixed effects.

Dependent variable: Tobin's Q	**Model 1**	**Model 2**	**Model 3**	**Model 4**
CSR	-0.0325***	-0.0344***	-0.0301***	-0.0322***
	(-14.26)	(-14.98)	(-13.35)	(-14.11)
R&D	0.1334***	0.1371***	0.0874***	0.0894***
	(15.05)	(15.52)	(8.97)	(9.20)
HHI	-0.8032***	-0.5236*	-0.7726	3.0694***
	(-2.89)	(-1.86)	(-0.92)	(2.77)
Leverage	-1.2325***	-1.1789***	-1.0441***	-0.9903***
	(-6.91)	(-6.62)	(-5.85)	(-5.55)
ROA	0.0069***	0.0063***	0.0066***	0.0058***
	(3.90)	(3.55)	(3.73)	(3.28)
Market Cap	0.2585***	0.2894***	0.2912***	0.3121***
	(11.34)	(12.18)	(12.58)	(13.11)
Capex	-0.1293***	-0.1253***	-0.1315***	-0.1254***
	(-11.34)	(-11.01)	(-10.98)	(-10.49)
Observations	2770	2770	2770	2770
Year Fixed Effects	NO	YES	NO	YES
Industry Fixed Effects	NO	NO	YES	YES
Adjusted R-squared	0.2199	0.2315	0.2673	0.2778

Leverage is negative and significant throughout all 4 columns. This means high leverage reduces firm value. The result is consistent with prior studies such as Lang et al. (1996) and Al-Hadi et al (2019). It supports the view that the debt overhang issue affects a firm's risk-taking ability and leads to lower firm value. ROA is positive and significant through all 4 models. It is consistent with the view that better profitability results in higher firm value (Jayachandran et al, 2013). Market capitalisation is positive and significant through all 4 models. It suggests bigger firms have higher firm value. This is

consistent with Gooding and Wagner III (1985) and Gupta et al. (2017). Capex is negative and significant across the 4 models, indicating that investment in capital assets decreases firm value in Australia. The negative relationship between firm value and Capex contrasts with Ho et al. (2016) and Gupta et al. (2017) who both find positive coefficients between Capex and Tobin's Q using the U.S. and an international sample, respectively. This could be due to the fact that basic materials, industrial and energy/utilities companies make up a large proportion of the Australian market. McConnell and Muscarella (1985) suggest that industrial and public utility firms are less likely to have positive net present value investment opportunities, therefore the investment in capital assets may not be considered by investors as a value adding activity.

4.4 Results for HHI subgroups

Aghion et al. (2005) note that there is an inverted U shape between competition and innovation. Specifically, when the level of competition is low the innovation rate increases with competition level increases because there are incentives for competing firms to innovate for the purpose of obtaining competitive advantage, up to a point of equilibrium. Beyond this point the innovation rate decreases when competition level increases because the laggard firms are discouraged to innovate as there is little extra competitive advantage to be gained from innovation. If the relationship between competition and firm valuation is not linear, it may explain the earlier inconsistent findings for HHI. To examine the possibility that HHI has a non-linear relationship on firm value, I follow Acabado et al. (2019) and divide the sample into 3 subgroups. The low HHI group (high market competition) are those firm-year observations with a HHI below 0.15; the medium HHI group (medium market competition) are those fall between 0.15 and 0.25; and the high HHI group (low market competition) are the firm-years with a HHI above 0.25. As guided by the U.S. Department of Justice, the 3 different subgroups indicate a competitive marketplace, moderately concentrated marketplace, and highly concentrated marketplace, respectively. Table 6 lists the results with 3 HHI subgroups.

In the high HHI group (low market competition), the coefficient for R&D switched sign (in Model 1) when controlling for year fixed effect and industry fixed effect. The results indicate that in a highly concentrated marketplace R&D investment decreases firm value. The rationale behind this finding could be that for companies in highly concentrated markets R&D is an unnecessary cost, as they do not have many competitors around, and thus have no need to pursue competitive advantages. Separating HHI to control for any non-linear effects does not impact the coefficients for CSR which remains consistently negative across all 3 subgroups controlling for the firm or industry fixed effects, as well as controlling for firm level cluster standard errors. In contrast to my hypothesis 1 that better CSR performance improve firm value, the results show better CSR harms firm value.

ROA has a positive coefficient on firm value only for the low HHI group (high market competition), consistent when controlling for fixed industry effects. In a competitive market, better financial performance contributes to higher firm value. Capex is only significant in the high HHI group (low market competition) in Model 1 where the coefficient is positive and significant at the 1% level. This suggests in highly concentrated industries capital expenditure is valued by investors, whereas in competitive market or moderately concentrated market the relationship is unclear. This could imply that in a highly concentrated market, safer investment (Capex) is preferred by investors than the riskier (R&D) investment. However, once firm fixed effects and firm level standard errors are included the effect disappears.

Table 6 - HHI Subgroups

This table reports the regression results based on $Tobin's\ Q_{i,t} = \alpha + \beta_1 CSR_{i,t} + \beta_2 R\&D_{i,t} + \beta_3 HHI_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Market\ Cap_{i,t} + \beta_6 ROA_{i,t} + \beta_7 Capex\ Intensity_{i,t}$ with observations divided into 3 groups according to HHI. The low HHI group are those firm-year observations with a HHI below 0.15; the medium HHI group are those fall between 0.15 and 0.25; and the high HHI group are the firm-years with a HHI above 0.25. The sample period is from 2002 to 2019. All variables except for CSR and HHI are winsorised at the 1st and 99th percentile values. Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. CSR is not winsorised as the values are in a small range of discrete numbers. R&D is R&D spending over total assets. HHI is calculated as: $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. HHI is not winsorised as the values fall in a small range of discrete numbers. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in natural logarithm form. Capex intensity is calculated by capital expenditure over total assets. T-Statistics are presented in the brackets below the coefficient estimates. * indicates significant at 10%, ** indicates significant at 5% and *** indicates significant at 1%. Model 1 presents results controlling for year fixed effects and industry fixed effects. Model 2 presents results controlling for year and firm fixed effects. Model 3 presents results controlling for both year fixed effects and industry fixed effects with firm level clustered standard errors.

	Model 1			Model 2			Model 3		
	Low HHI Group	**Medium HHI Group**	**High HHI Group**	**Low HHI Group**	**Medium HHI Group**	**High HHI Group**	**Low HHI Group**	**Medium HHI Group**	**High HHI Group**
CSR	-0.02***	-0.03***	-0.01*	-0.00	-0.01	-0.02***	-0.01***	-0.03***	-0.02***
	(-7.25)	(-8.57)	(-1.96)	(-1.02)	(-1.22)	(-4.48)	(-4.35)	(-8.51)	(-4.13)
R&D	8.37***	9.33***	-13.58***	-0.03	67.71**	-16.71	7.80**	9.63***	-19.85
	(4.28)	(9.29)	(-4.56)	(-0.03)	(1.97)	(-0.57)	(2.27)	(9.60)	(-0.68)
Leverage	-1.37***	-0.58*	-0.70*	-0.16	-1.16**	-0.52	-1.40***	-0.63**	-0.50
	(-5.58)	(-2.22)	(-2.40)	(-0.54)	(-2.33)	(-1.36)	(-3.43)	(-2.47)	(-1.31)
ROA	0.08***	-0.01***	0.02***	-0.01***	-0.01	-0.01**	0.08***	-0.01***	-0.01**
	(22.91)	(-4.87)	(7.29)	(-6.79)	(-1.08)	(-2.38)	(5.79)	(-4.52)	(-2.20)
Market Cap	0.08***	0.34***	0.18***	0.52***	0.16**	0.12**	0.07**	0.33***	0.12**
	(3.93)	(9.71)	(7.83)	(11.57)	(2.28)	(2.58)	(2.26)	(10.11)	(2.50)
Capex	0.76	-0.24	2.82***	-0.33	0.19	-0.09	0.62	-0.29	-0.47
	(0.92)	(-0.45)	(3.81)	(-0.76)	(0.28)	(-0.16)	(0.45)	(-0.56)	(-0.81)
Observations	1250	1100	1250	1100	420	420	1250	1100	420
Year	17	17	17	17	18	18	17	17	18
Firm	185	192	185	192	89	89	185	192	89
Year Fixed Effect		Yes			Yes			Yes	
Industry Fixed Effect		Yes						Yes	
Firm Fixed Effect					Yes				
Adjusted R-squared	0.49	0.28	0.85	0.75	0.55	0.19	0.48	0.28	0.14

4.5 Results with Interaction Terms

To study whether the effect of CSR and R&D on firm value are dependent on each other and/or the market competition level, testing H2, I incorporate interaction terms for CSR*R&D into equation 1. Further, to investigate the impact of market competition on CSR (H3) and CSR and R&D jointly (H4), I split the sample into high, medium and low HHI. The results are shown in Table 7. The interaction term CSR*R&D has a negative coefficient in high HHI group (low market competition) consistent through all 3 models. The negative coefficients suggest that over and above the individual effects, the joint effect of CSR and R&D results in a reduction in firm value. This suggests investors see firms with good CSR performance making R&D investment as value destructive. It could also mean that contrary to expectation, the investment for CSR and the investment for R&D are substitutes rather than complements for low market competition industries. However, the coefficients are inconsistent for low HHI group (high market competition) and medium HHI group (moderate market competition) companies.

Table 7 - Results with Interaction Terms

This table reports the regression results based on the original regression equation incorporated with dummy variables (Low HHI equals 1 when the observation has an HHI below 0.15; High HHI equals 1 when the observation has an HHI above 0.25), together with the interaction terms CSR*R&D, CSR*HHI, R&D*HHI, and CSR*R&D*HHI. The sample period is from 2002 to 2019. All variables except for CSR and HHI are winsorised at the 1st and 99th percentile values. Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. CSR is not winsorised as the values are in a small range of discrete numbers. R&D is R&D spending over total assets. HHI is calculated as: $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. HHI is not winsorised as the values fall in a small range of discrete numbers. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in natural logarithm form. Capex intensity is calculated by capital expenditure over total assets. T-Statistics are presented in the brackets below the coefficient estimates. * indicates significant at 10%, ** indicates significant at 5%, and *** indicates significant at 1%. Model 1 presents results controlling for year fixed effects and industry fixed effects. Model 2 presents results controlling for both year and firm fixed effects. Model 3 presents results controlling both industry and year fixed effects with firm level clustered standard errors.

	Model 1			Model 2			Model 3		
	Low HHI Group	**Medium HHI Group**	**High HHI Group**	**Low HHI Group**	**Medium HHI Group**	**High HHI Group**	**Low HHI Group**	**Medium HHI Group**	**High HHI Group**
CSR	-0.02***	-0.04***	-0.02***	-0.01*	-0.00	-0.01	-0.02***	-0.03***	-0.02***
	(-7.53)	(-8.93)	(-3.77)	(-1.82)	(-0.66)	(-0.92)	(-4.47)	(-5.09)	(-2.70)
R&D	-10.44	1.14	276.76***	-8.09	2.81	201.02**	-11.97	0.91	232.86
	(-1.53)	(0.33)	(3.29)	(-1.21)	(1.08)	(2.51)	(-1.20)	(0.08)	(1.40)
CSR*R&D	0.46***	0.20**	-6.20***	-0.16	-0.07	-3.23*	-0.49**	0.21	-5.32*
	(2.88)	(2.51)	(-3.71)	(-0.92)	(-1.23)	(-1.84)	(2.14)	(0.74)	(-1.84)
Leverage	-1.46***	-0.55**	-0.48	-0.70**	-0.15	-1.13**	-1.49***	-0.61	-0.45
	(-5.91)	(-2.12)	(-1.29)	(-2.38)	(-0.50)	(-2.28)	(-3.60)	(-1.58)	(-0.81)
ROA	0.08***	-0.01***	-0.01**	0.02***	-0.01***	-0.01	0.08***	-0.01*	-0.01
	(23.10)	(-5.28)	(-2.38)	(7.24)	(-6.59)	(-1.18)	(5.83)	(-1.84)	(-1.04)
Market Cap	0.08***	0.35***	0.12***	0.18***	0.52***	0.15**	0.08**	0.34***	0.12*
	(3.92)	(9.92)	(2.60)	(7.82)	(11.48)	(2.12)	(2.27)	(5.53)	(1.95)
Capex	0.85	-0.35	-0.27	2.82***	-0.31	0.05	0.71	-0.40	-0.62
	(1.04)	(-0.68)	(-0.47)	(3.81)	(-0.71)	(0.07)	(0.51)	(-0.56)	(-0.68)
Observations	1250	1100	420	1250	1100	420	1250	1100	420
Year	17	17	18	17	17	18	17	17	18
Firm	185	192	89	185	192	89	185	192	89
Year Fixed Effect		Yes			Yes			Yes	
Industry Fixed Effect		Yes						Yes	
Firm Fixed Effect					Yes				
Adjusted R-squared	0.49	0.29	0.21	0.85	0.75	0.55	0.48	0.28	0.16

The results do not provide support for H2. In general CSR has a negative impact on firm performance, whereas R&D has a significant positive impact on low market competition firms only. The joint effect for CSR and R&D is positive for high market competition and medium market competition firms when controlling for industry fixed effects. However, the joint effect for CSR and R&D is negative for low market competition firms when controlling for either industry fixed effect or firm fixed effects. Hypothesis 3, the value creation from CSR is greater in high market competition industries, is also not supported. The results show a negative impact from CSR consistent across all three market competition forms. Hypothesis 4, the joint effects of CSR and R&D have a higher impact on the firms

from high market competition industries is supported when controlling for industry fixed effects. The coefficient for CSR*R&D is 0.46 in high market competition industries. The coefficient drops to 0.20 in medium market competition industries. Yet it drops to -6.20 in low market competition industries. However, this effect disappears once controlling for firm fixed effect or controlling for industry fixed effects with firm level clustered standard errors.

4.6 Robustness Test

4.6.1 Dropped Observations

To ensure the robustness of my main findings for H1 and H2, I conduct several additional tests. Table 8, Model 1 shows the results when excluding Financials, Energy, and Utilities industries from the sample. The financial industry is very different from other industries due to its characteristics - high leverage, low fixed assets value, and high regulations etc. Equally, Energy and Utilities firms are subject to heavy regulations as well. A lot of prior studies exclude observations from financial institutions from their sample when considering firm value, as the regulation imposed often restricts the profitability and limits risk-taking by these firms (Foerster and Sapp, 2005; Acharya et al., 2011; Banerjee & Gupta, 2017).

Table 8, Model 2 presents the result when excluding observations from Basic Materials industry. Observations from Basic Materials industry make up 25% of the sample. I remove these observations to check if the high percentage of basic material observations in the sample drives my earlier findings. Table 8, Model 3 shows the result when excluding both Financials, Energy, Utilities, and Basic Materials observations, which reduces the number of observations to 1326.

The findings across the 3 models remain broadly consistent with the baseline results. The coefficients of CSR remain negatively significant across all 3 models. The coefficients of R&D, leverage, and Market cap are consistent with the baseline results. The impact from ROA and Capex are inconsistent. The coefficient for ROA is negative when excluding Financials, Energy, and Utilities observations as shown in Model 1, whereas in Model 2 when excluding Basic Materials observations and in Model

3 when excluding Financials, Energy, Utilities, and Basic Materials observations, the coefficients are positive. In the baseline results, the coefficient for ROA is always positive. The coefficients for Capex are insignificant in Model 1 and Model 3, it becomes positive in Model 2 when excluding Basic Materials observations only, whereas in the baseline results it is always negative. This suggests the negative impact from capex on firm value is mostly driven by the observations from Basic Materials industry. Due to the characteristics of the Basic Materials industry, large capital investment costs may not be recovered over a long time of production, therefore investors may not value a capital expenditure as value adding.

Table 8 - Dropped Observations

This table reports the regression results based on the original regression equation. The sample period is from 2002 to 2019. All variables except for CSR and HHI are winsorised at the 1st and 99th percentile values. Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. CSR is not winsorised as the values are in a small range of discrete numbers. R&D is R&D spending over total assets. HHI is calculated as: $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. HHI is not winsorised as the values fall in a small range of discrete numbers. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in natural logarithm form. Capex intensity is calculated by capital expenditure over total assets. T-Statistics are presented in the brackets below the coefficient estimates. * indicates significant at 10%, ** indicates significant at 5%, and *** indicates significant at 1%. Model 1 presents results excluding observations from Financials, Energy, and Utilities. Model 2 presents results excluding observations from Basic Materials. Model 3 presents results excluding observations from Financials, Energy, Utilities, and Basic Materials. All 3 models use firm-level clustered standard errors.

Dependent variable: Tobin's Q	**Model 1 Excl Financials, Energy, and Utilities**		**Model 2 Excl Basic Materials**		**Model 3 Excl Financials, Energy, Utilities, and Basic Materials**	
CSR	-0.03***	-0.01*	-0.02***	-0.00	-0.02***	-0.01*
	(-11.79)	(-1.95)	(-10.19)	(-1.02)	(-6.98)	(-1.94)
R&D	7.37**	0.60	1.77	-11.72***	6.45*	-7.67***
	(2.28)	(0.23)	(0.52)	(-4.53)	(1.83)	(-2.95)
CSR*R&D	0.12	-0.04	0.29***	0.14**	0.17**	0.11*
	(1.64)	(-0.60)	(3.75)	(2.48)	(2.14)	(1.93)
Leverage	-1.51***	-0.64***	-1.69***	-0.39*	-2.23***	-0.31
	(-6.84)	(-2.80)	(-8.47)	(-1.79)	(-7.58)	(-1.04)
ROA	0.00	-0.01***	0.04***	0.01***	0.04***	0.01***
	(0.90)	(-3.83)	(17.75)	(5.08)	(12.22)	(2.86)
Market Cap	0.31***	0.48***	0.10***	0.14***	0.26***	0.59***
	(10.70)	(14.24)	(5.40)	(8.40)	(7.18)	(13.64)
Capex	0.04	0.58	1.28**	2.13***	0.12	1.84**
	(0.08)	(1.43)	(2.33)	(4.52)	(0.13)	(2.36)
Observations	2016	2016	2080	2080	1326	1326
Year	244	244	250	250	169	169
Firm	18	18	18	18	16	16
Year Fixed Effects	Yes	Yes	Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes	
Firm Fixed Effects		Yes		Yes		Yes
Adjusted R-squared	0.25	0.72	0.36	0.80	0.38	0.80

These findings indicate that the negative impact from CSR, and the positive impact from R&D on firm value are not biased due to the highly regulated industries or the high proportion from the Basic Materials observations.

The findings in Table 8 are against H1, as the results show that CSR has a negative impact on firm value. But it provides partially support for H2 as R&D has a positive impact on firm value when controlling for industry fixed effect; also, the joint effect of CSR and R&D appears to be positive.

To test if the negative CSR coefficient in the baseline results is driven by those industries selling distinguishable products to consumers indirectly, I dropped the observations from Basic Materials, Industrials, and the Energy industries. The results are shown in Table 9. Compared with the baseline results, the coefficients for CSR remains negative, this suggests that CSR is value destructive across all firms and is not driven by industries selling indirectly to consumers. Specifically, for industries selling directly to individual consumers, more competition results in higher firm value. This finding partially supports H2, that CSR and R&D enhance firm performance jointly. The negative CSR coefficient however, suggests that the results are not driven by those industries selling distinguishable products to consumers indirectly.

Table 9 - Results for Industries Selling Directly to Consumers

This table reports the regression results based on the original regression equation. The sample covers all observations exclude those from Basic Materials, Industrials, and the Energy industries. The sample period is from 2002 to 2019. All variables except for CSR and HHI are winsorised at the 1st and 99th percentile values. Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. CSR is not winsorised as the values are in a small range of discrete numbers. R&D is R&D spending over total assets. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. HHI is not winsorised as the values fall in a small range of discrete numbers. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in natural logarithm form. Capex intensity is calculated by capital expenditure over total assets. T-Statistics are presented in the brackets below the coefficient estimates. * indicates significant at 10%, ** indicates significant at 5% and *** indicates significant at 1%. Model1 presents results controlling for both year fixed effects and industry fixed effects. Model 2 presents results controlling for year and firm fixed effects. Model 3 controls for year and industry fixed effects with firm-level clustered standard errors.

Dependent variable: Tobin's Q	**Model 1**	**Model 2**	**Model 3**
CSR	-0.02***	-0.00	-0.02***
	(-8.49)	(-0.62)	(-8.01)
R&D	5.70	-10.25***	3.67
	(1.58)	(-3.77)	(1.02)
CSR*R&D	0.22***	0.13**	0.27***
	(2.77)	(2.17)	(3.34)
Leverage	-2.25***	-0.73**	-2.38***
	(-8.85)	(-2.43)	(-9.39)
ROA	0.07***	0.02***	0.07***
	(22.14)	(6.40)	(21.83)
Market Cap	0.10***	0.16***	0.08***
	(4.59)	(7.84)	(3.83)
Capex	0.58	1.96**	0.57
	(0.69)	(2.40)	(0.68)
Observations	1572	1572	1572
Year	18	18	18
Firm	198	198	198
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes		Yes
Firm Fixed Effects		Yes	
Adjusted R-squared	0.45	0.82	0.44

4.6.2 Instrumental Variables

There is also the potential for endogeneity problems. Firm value can be a factor that affects management decision-making when considering CSR and R&D investment decisions. Highly valued companies are exposed to greater public scrutiny, they maybe more likely to take CSR actions. To control for the potential endogeneity bias, I employ instrumental variables for CSR and R&D. Following Banerjee and Gupta (2017), I construct an instrumental variable for CSR, IV_CSR, which is calculated for each firm by computing the mean CSR score of the rest of the industry in a particular year excluding that specific firm. This process is repeated for each observation. Then I used the same approach to get an IV_R&D/Total Assets. The rationale behind the use of industry average CSR and R&D to replace the firm's specific CSR and R&D is that the industry average CSR and R&D without the specific firm in it are correlated with the firm level CSR and R&D but not correlated with firm value. Bernstein and Nadiri (1989) asserts R&D investment differs from other forms of investment because the benefits can be obtained by other peer companies freely. The R&D spill over effect implies the firm level of R&D is driven by the behaviour of its peers, however the firm by itself is not able to heavily influence the industry norms. CSR investment, which shares a lot of similarities with R&D investment as discussed in the above sections, similarly is driven by the industry norms. The IV regression results are computed by replacing the CSR variable from the baseline regression model with the IV_CSR, and by replacing the R&D variable from the baseline regression model with the IV_R&D/Total Assets.

Table 10 shows the result with the instrumental variables. All first stage IV CSR have negative coefficients for whole sample as well as for the subgroups. The second stage regression have negative CSR coefficients for the whole sample as well as the low HHI (high market competition) group. This suggest my finding that CSR has a negative impact on firm value is robust. The first stage IV R&D have very strong negative coefficients for whole sample as well as for the subgroups. Whereas the second stage regression observe very small coefficients close to 0. This could imply that companies in the same industry vary a lot in terms of investment in R&D.

Table 10 - Results with IV

This table reports the regression results based on the original regression equation. With IV_CSR replacing CSR and IV_R&D/TA replacing R&D. The observations are divided into 3 groups according to HHI. The low HHI group are those firm-year observations with a HHI below 0.15; the medium HHI group are those fall between 0.15 and 0.25; and the high HHI group are the firm-years with a HHI above 0.25. The sample period is from 2002 to 2019. All variables except for IV_CSR and HHI are winsorised at the 1st and 99th percentile values. Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. IV_CSR is calculated for each firm by computing the mean CSR score of the rest of the industry in a particular year excluding that specific firm. IV_CSR is not winsorised as the values are in a small range of discrete numbers. IV_R&D/TA is calculated for each firm by computing the mean R&D over total assets of the rest of the industry in a particular year excluding that specific firm. HHI is calculated as: $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. HHI is not winsorised as the values fall in a small range of discrete numbers. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in natural logarithm form. Capex intensity is calculated by capital expenditure over total assets. T-Statistics are presented in the brackets below the coefficient estimates. * indicates significant at 10%, ** indicates significant at 5% and *** indicates significant at 1%.

	Whole Sample			Low HHI			Medium HHI			High HHI		
	CSR	**RD**	**Second Stage**	**CSR**	**RD**	**Second Stage**	**CSR**	**RD**	**Second Stage**	**CSR**	**RD**	**Second Stage**
Constant	-47.90***	-52031.48		19.64	18354.72**		-70.79***	-138386.3*		-31.57*	-131804.4*	
	-6.91	-1.61		1.22	2.25		-6.78	-1.75		-1.8	-1.66	
IV CSR	-0.56***	-111.57		-1.24***	-253.91		-1.03***	-920.65		-1.00***	227.47	
	-5.83	-0.44		-5.81	-1.35		-5.48	-0.90		-4.14	0.91	
IV R&D	-2.84	-543299.4***		-135.87	-530666.8*		65.84*	-696149.60***		-394.75	-3305054***	
	-0.07	-3.28		-1.33	-1.72		1.81	-3.26		-1.26	-4.67	
CSR			-0.06**			-0.05***			-0.04			-0.01
			-1.97			-3.01			-1.63			-1.07
R&D			0.00*			0.00*			0.00			0.00
			1.92			1.75			1.03			0.56
HHI	54.53***	48388.33*	5.13**	-147.33**	-21857.4	-0.82	279.32***	190297.3	5.94	75.61***	8428.31	1.12
	3.66	1.86	2.14	-2.21	-0.77	-0.13	6.3	1.16	0.63	2.72	0.23	1.04
Leverage	4.70	14543.38	-1.71***	2.60	16084.21	-2.88***	8.70**	20156.28	-1.07**	-13.68***	-12004.46	-0.35
	1.62	1.44	-4.23	0.66	1.24	-3.28	2.30	0.99	-2.52	-2.21	-0.78	-0.51
ROA	-0.12***	97.3853	0.00	-0.33***	92.66*	-0.05***	-0.03	31.57	-0.02***	-0.08	-101.69	-0.01
	-4.37	1.28	0.08	-6.01	1.76	3.86	-1.12	0.55	-2.68	-1.36	-0.71	-1.05
Market Cap	6.27***	4661.72**	0.24	6.52***	982.94	0.25	5.31***	7370.01	0.24*	6.63***	8217.89**	0.01
	18.54	2.14	1.26	10.94	1.19	2.04**	13.48	1.55	1.73	12.03	2.13	0.09
Wald			217.34			159.61			127.53			221.87
R-Squared	0.50	0.13		0.55	0.06		0.51	0.17		0.58	0.25	
Observations	2,761	2,761	2,761	1249	1249	1249	1100	1100	1100	412	412	412
Firms	325	325	325	185	185	185	192	192	192	89	89	89

4.6.3 Control for Global Financial Crisis

This section is to provide a robustness check on my earlier findings regarding the negative impact of CSR on firm performance and the positive joint effect of CSR and R&D on firm performance. Some literature controls for the impact of the Global Financial Crisis (Lauesen, 2013; Muhammad et al., 2015; Dias et al., 2016) based on the argument that the relationship between CSR and firm value may differ between good economic conditions and bad economic conditions. In bad economic conditions the main focus for a business may be sustain rather than expand or improve.

To examine if the results are impacted by the Global Financial Crisis, I include a GFC dummy, the results are shown below in Table 11. The GFC dummy equals 1 for the observations from 2007 to 2009, and 0 for the rest of the observations. The year dummies are replaced by the GFC dummy. CSR remains negatively related to firm value. R&D also retains its positive and significant coefficient. The signs for leverage, ROA, and Market cap remain unchanged. HHI has a negative and significant coefficient irrespective of whether I control for industry fixed effects or not. It suggests market competition level has a consistent impact on firm value, which is that firms in less concentrated markets have higher value.

Table 11 - Results for Controlling for GFC

This table reports the regression results based on the original regression equation with GFC dummy included. The GFC dummy equals 1 for the observations from 2007 to 2009, and 0 for the rest of the observations. The sample period is from 2002 to 2019. All variables except for CSR and HHI are winsorised at the 1st and 99th percentile values. Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. CSR is not winsorised as the values are in a small range of discrete numbers. R&D is R&D spending over total assets. HHI is calculated as: $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. HHI is not winsorised as the values fall in a small range of discrete numbers. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in natural logarithm form. Capex intensity is calculated by capital expenditure over total assets. T-Statistics are presented in the brackets below the coefficient estimates. * indicates significant at 10%, ** indicates significant at 5% and *** indicates significant at 1%. Model 1 presents results controlling for industry fixed effects. Model 2 presents results controlling for firm fixed effects. Model 3 presents results with firm-level clustered standard errors.

Dependent variable: Tobin's Q	**Model 1**	**Model 2**	**Model 3**
CSR	-0.03***	-0.02***	-0.03***
	(-14.84)	(-6.95)	(-6.74)
R&D	6.77**	0.04	6.77
	(2.09)	(0.02)	(0.62)
CSR*R&D	0.18**	-0.03	0.18
	(2.45)	(-0.54)	(0.70)
Leverage	-1.42***	-0.64***	-1.42***
	(-8.17)	(-3.41)	(-4.32)
ROA	0.01***	-0.00**	0.01*
	(5.88)	(-1.97)	(1.72)
Market Cap	0.23***	0.40***	0.23***
	(10.40)	(15.19)	(5.63)
Capex	0.25	1.12***	0.25
	(0.65)	(3.48)	(0.42)
Observations	2770	2770	2770
Year	18	18	18
Firm	325	325	325
GFC	YES	YES	YES
Industry Fixed Effects	YES		YES
Firm Fixed Effects		YES	
Adjusted R-squared	0.25	0.74	0.25

The results are consistent with my baseline findings. H1 is rejected as CSR has a negative impact on firm performance. H2 is partially supported as the joint impact of CSR and R&D appear to be positively significant even controlling for the impact of the Global Financial Crisis.

4.6.4 CSR Category Split and Industry Split

This section provides further robustness testing on my earlier findings regarding the negative impact of CSR on firm performance and the positive joint effect of CSR and R&D on firm performance. Individual CSR areas are studied in some literature. Al-Tuwaijri et al. (2004) studied the environment component of CSR and its relationship with economic performance. Kim et al. (2012) studied the corporate governance and environment components of CSR and their relationship with earnings quality. Clacher and Hagendorff (2012) studied environmental and social aspects of CSR and the relationship with shareholder's wealth. It is possible that an individual component of CSR has an impact on firm value while other components do not. Panel A of Table 12 shows the results by replacing the overall CSR score by environmental, social, and governance pillars scores. The results of the CSR split show environment and governance aspects contribute to the negative effect, whereas the social aspect has some negative impact only on the medium HHI (moderate market competition) industries. The above findings could be due to the fact that environmental and governance aspects of CSR actions require greater costs than social CSR investment. It suggests the results are robust to different CSR measurement aspects. Panel B of Table 12 shows the result by splitting the sample by industries. It suggests the negative impact of CSR are consistent across industries. Among all industries, companies from Health Care have the strongest impact from CSR with a coefficient of -0.05, which means a 1% improvement in CSR performance reduces firm value by 5. R&D has positive impact on firm value for only consumer discretionary/ consumer staples and industrials/ basic materials. This partially supports that the impact by R&D are not driven by industries selling directly to individual customers.

Table 12 - Results of CSR Split and Industry Split

Panel A reports the regression results based on the original regression equation with CSR score being split between Environment Pillar Score, Social Pillar Score, and Governance Pilar Score. The sample period is from 2002 to 2019. All variables except for CSR and HHI are winsorised at the 1st and 99th percentile values. Tobin's Q is calculated as the sum of total debt and market value of equity divided by total assets. CSR is not winsorised as the values are in a small range of discrete numbers. R&D is R&D spending over total assets. HHI is calculated as: $HHI = S_1^2 + S_2^2 + S_3^2 + \cdots + S_n^2$ where S is the market share of a given firm. The market share for one company is calculated by the sales of that company in that year divided by the total sales of the industry in that year. HHI is not winsorised as the values fall in a small range of discrete numbers. Leverage is calculated by total debts over total assets. ROA is calculated by net income over total assets. Market Cap is in natural logarithm form. Capex intensity is calculated by capital expenditure over total assets. T-Statistics are presented in the brackets below the coefficient estimates. * indicates significant at 10%, ** indicates significant at 5% and *** indicates significant at 1%. The first column in each group presents results controlling for year and industry fixed effects with firm-level clustered standard errors. The second column in each group presents results controlling for year and firm fixed effects. Panel B reports regression results based on the original regression equation with the whole sample split by industries with firm-level clustered errors.

Panel A – Results of CSR Split

Dependent variable: Tobin's Q	**Low HHI Group**		**Medium HHI Group**		**High HHI Group**	
Environment Pillar Score	-0.01**	0.00	-0.00	0.00	-0.02***	-0.00
	(-2.51)	(0.82)	(-0.71)	(0.76)	(-3.44)	(-0.76)
Social Pillar Score	0.00	-0.00	-0.02***	-0.00	0.00	0.00
	(0.28)	(-0.69)	(-4.06)	(-0.70)	(0.91)	(0.07)
Governance Pillar Score	-0.01***	-0.00	-0.01***	-0.00	-0.01**	-0.01*
	(-6.78)	(-1.22)	(-4.37)	(-1.52)	(-2.48)	(-1.71)
R&D	8.95***	-13.37***	9.22***	0.14	4.07	67.90**
	(4.61)	(-4.48)	(9.19)	(0.12)	(0.14)	(1.98)
Leverage	-1.36***	-0.69**	-0.42	-0.18	-0.67*	-1.15**
	(-5.59)	(-2.35)	(-1.58)	(-0.59)	(-1.78)	(-2.30)
ROA	0.08***	0.02***	-0.01***	-0.01***	-0.01**	-0.00
	(22.28)	(7.09)	(-5.25)	(-6.63)	(-2.58)	(-1.04)
Market Cap	0.12***	0.18***	0.39***	0.53***	0.17***	0.18**
	(5.36)	(7.73)	(10.32)	(11.59)	(3.21)	(2.51)
Capex	0.50	2.83***	-0.13	-0.29	-0.03	0.12
	(0.61)	(3.83)	(-0.25)	(-0.65)	(-0.06)	(0.17)
Observations	1250		1100		420	
Year	17		17		18	
Firm	185		192		89	
Year Fixed Effects	YES		YES		YES	
Industry Fixed Effects	YES		YES		YES	
Firm Fixed Effect		YES		YES		YES
Adjusted R-squared	0.50	0.85	0.29	0.75	0.21	0.55

Panel B – Results of Industry Split

Dependent variable: Tobin's Q	Technology/ Telecommunications	Health Care	Financials / Real Estate	Consumer Discretionary /Consumer Staples	Industrials / Basic Materials	Energy/ Utilities
CSR	-0.04***	-0.05**	-0.01***	-0.01***	-0.03***	-0.01***
	(-2.91)	(-2.37)	(-3.67)	(-2.86)	(-9.94)	(-4.62)
R&D	-6.94	-2.76	-37.62	24.97***	63.03***	66.73
	(-0.43)	(-0.33)	(-0.58)	(3.59)	(3.50)	(0.38)
CSR*R&D	0.27	0.29	1.28	-0.11	-0.51	-0.60
	(0.61)	(1.63)	(1.23)	(-0.70)	(-0.94)	(-0.14)
Leverage	-7.73***	-2.69**	-1.52***	-0.66*	-0.40*	0.48**
	(-5.41)	(-2.45)	(-5.11)	(-1.74)	(-1.75)	(-2.31)
ROA	0.06***	0.02**	0.13***	0.06***	0.02***	-0.01***
	(3.68)	(2.07)	(27.95)	(12.51)	(-8.02)	(-3.24)
Market Cap	0.47***	0.54***	0.04*	0.11***	0.30***	0.15***
	(2.76)	(4.00)	(2.04)	(2.69)	(10.24)	(5.38)
Capex	-5.02	-12.24	-0.34	1.00	-0.38	0.38
	(-1.48)	(-1.17)	(-0.27)	(1.00)	(-0.88)	(1.12)
Observations	140	192	623	522	958	335
Year	16	16	18	16	18	16
Firm	28	25	69	67	100	36
Adjusted R-squared	0.35	0.22	0.65	0.42	0.20	0.11

Chapter 5. Conclusion

This study investigates the relationship between CSR, R&D, market competition level, and firm value in Australia. I find CSR scores are higher in more competitive industries. At the same time, CSR is, in general, value destructive to Australian public firms. This negative relationship is consistent across all industries. When breaking down the overall CSR score by environmental, social, and governance aspects, the negative relationship is found to be driven mainly by the environmental and governance aspects of CSR. R&D on the other hand, is positively related to firm value, which is broadly consistent throughout all robustness checks. In addition, the joint effect of CSR and R&D is negative, suggesting there is a penalty for firm's undertaking both CSR actions and innovation, or the investments for CSR and R&D are substitutes rather than complements.

Additionally, the results do not suggest that product market competition impacts the relationship between CSR and firm value, suggesting that, at least for Australian firms, CSR does not appear to create competitive advantages. However, when I apply the industry average (excluding the firm) for CSR and R&D, as instrumental variables to control for potential endogeneity, I find a positive coefficient with CSR for firms in moderately competitive industries. The findings suggest additional analysis is required in different settings to further clarify the role of CSR on firm value.

The negative impact from CSR and HHI, and the positive impact from R&D on firm value are robust to dropping observations from highly regulated industries. It is also not biased due to the high proportion of observations from a single industry (Basic Materials). The results persist when controlling for the impact of the Global Financial Criss. The impact from three different aspects of CSR (environment, social, and governance) are consistent with the impact from the overall CSR performance.

This study is limited by the availability of CSR scores. A great number of observations are dropped due to the fact that CSR score is not available from the Thompson Reuters ASSET 4 database. Due to this limitation, the sample used may not be the best representation for the whole Australian market.

A suggestion for further research is to find or construct a better proxy for CSR that can represent most of the companies.

Chapter 6. References

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