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Corporate social responsibility, product market competition, and firm value

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ABSTRACT

This study empirically examines if and how product market competition influences the relation between corporate social responsibility (CSR) and firm value using a panel data set for the period 2003–2015. It explicitly recognizes the endogeneity of CSR and uses instrumental variable (IV-GMM) estimation regressions. Results indicate that CSR is positively associated with market value of a firm measured by industry adjusted Tobin's Q. However, this relation is influenced by product market competition and product fluidity. Specifically, CSR has no impact on firm value in firms that operate in low product competition environments or face low product fluidity. Furthermore, results show that the effect of CSR is driven by CSR strengths as CSR concerns have no effect on firm value. Additional tests show that community, diversity and environment dimensions are the main contributors to the total effect of CSR.

1. Introduction

Corporate social responsibility (CSR) has attracted the attention of many academics and practitioners in the last three decades. Most of the research attempts to find a link between CSR and firm value in order to establish why firms engage in CSR. However, there is no unified theory that can explain the relation between CSR and firm value. There are two dominant views on the relation between CSR and firm value. The agency theory (Jensen & Meckling, 1976) argues that CSR is an agency problem (Friedman, 1970) and a value decreasing investment as managers use corporate resources to draw benefits of personal reputation at the expense of shareholders (Barnea & Rubin, 2010). On the other hand, the conflict resolution theory also known as the stakeholder theory (Freeman, 1984) contends that CSR in fact is a value increasing investment as it balances the interests of both financing and non-financing stakeholders who have influence over firm resources. It also considers CSR as a strategic investment that increases firm value by enhancing firm competitiveness.

The empirical evidence on the relation between CSR and firm value is also mixed and even confusing (e.g. Margolis & Walsh, 2003; Orlitzky, Schmidt, & Rynes, 2003; Post, Preston, & Sachs, 2002; Margolis, Elfenbein, & Walsh, 2009). Margolis and Walsh (2003) mention sampling problems, concerns about the reliability and validity of the social and financial performance measures, omission of controls, opportunities to test mediating mechanisms and moderating conditions, and a need for a causal theory to link, as possible explanations of the conflicting empirical evidence.

In this study, I argue that competition in product markets influences the relation between CSR and firm value and can help in explaining the circumstances where CSR is more valuable. Economic theory postulates that competition in product markets plays an important role in disciplining the risk and effort averse managers (Alchian, 1950; Hart, 1983; Schmidt, 1997; Stigler, 1958). When market competition is high, profit margins are thin and managers have fewer resources to divert to their personal benefits. Product

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market competition thus can be viewed as an external control device that enforces discipline upon managers. CSR also enables firms to differentiate and achieve competitive advantage (Jones, 1995) especially in high competition and high growth industries (Russo & Fouts, 1997). Furthermore, competition in product markets is perceived as a substitute for corporate governance (Ammann, Oesch, & Schmid, 2013; Giroud & Mueller, 2011).

However, reduction in free cash flows due to thin profit margins in intense competition creates a trade-off between investment in NPV positive projects that have certain positive effect on shareholder wealth and CSR that is not always correctly priced by the stock market. High competition also reduces returns to any cost reduction and differentiating strategy and motivates the manager to reduce investment in CSR. Siegel and Vitaliano (2007) argue that in perfectly competitive markets all firms would have the same CSR level as every firm will invest in CSR to achieve higher market share. The effect of competition on the relation between CSR and firm value is therefore unclear and an empirical question. This study attempts to empirically investigate if and how product market competition influences the relation between CSR and firm value.

While most of the previous studies on CSR and firm value mention endogeneity of CSR, few use empirical designs to treat it. This study explicitly recognizes the endogeneity issue and uses instrumental variable (IV-GMM) method as a research design. It uses the MSCI (formerly KLD) database to measure corporate social responsibility (CSR) and industry adjusted Tobin's Q to measure firm value for the period 2003–2015. It uses Hoberg and Phillips (2016) Herfindahl index of market concentration to measure competition and Hoberg, Phillips, and Prabhala, (2014) measure of product fluidity to measure product threats from competitors. Results indicate that CSR has a positive and significant effect on firm value. However, this positive effthreats from competitors. Results indicate that CSR has a positive and significant effect on firm value. However, this positive effect is statistically significant only in high competition markets and under high product fluidity. When markets are less competitive or product fluidity is low, CSR has no effect on firm value. Results also show that the effect of CSR is driven by CSR strengths and CSR concerns have no relation with firm value. Additional tests show that community, diversity and environment dimensions of CSR are positively related to firm value when competition (product fluidity) is high. Product and employee relations have no effect on firm value regardless of market competition or product fluidity. These results are robust to alternative measures of CSR, market competition, and firm value. The results also remain robust when the sample period is divided into pre and post financial crises periods.

This study adds to the current emerging literature on CSR, product competition, product fluidity and firm value (e.g. Fernández-Kranz & Santaló, 2010; Declerck & M'Zali, 2012; Jia and Shi, 2014). It is different from earlier studies in that it uses the recent time period (2003–2015) that has the most comprehensive coverage of MSCI social data.[1] It uses two different measures of market competition and uses product fluidity to measure threats coming from competitors. It treats CSR as endogenous and uses IV-GMM method to estimate the effect of competition on the relation between CSR and firm value. Furthermore, it controls for corporate governance and other variables that affect firm value.

The remainder of the study is organized as follows. Section 2 explains motivation and develops testable hypotheses. Section 3 presents data, measures of CSR, competition, product fluidity, and firm value. Section 4 describes empirical design. Section 5 discusses results, Section 6 checks the robustness of empirical results, and Section 7 concludes.

2. Motivation and hypotheses

2.1. CSR and firm value

Corporate social responsibility (CSR) has been a topic of discussion for the last three decades or so. Most of the discussions are centered on one question: does CSR increase firm value? Starting from the 1970s, hardcore economists considered CSR as waste of economic resources. The leading economic theory of agency cost (Jensen & Meckling, 1976) views CSR as a value decreasing investment and a misuse of corporate resources (Friedman, 1970). It argues that managers use corporate resources to enhance their personal reputations to extract rents from their firms (Barnea & Rubin, 2010). According to the agency theory, CSR is undertaken at the expense of shareholders and, therefore, results in lower firm value (Cronqvist, Heyman, Nilsson, Svaleryd, & Vlachos, 2009; Pagano & Volpin, 2005; Surroca, Tribo, & Waddock, 2010).

There are a number of empirical studies that find evidence in favour of the agency view of CSR. Galaskiewicz (1985) for example shows that CEOs spend corporate resources on philanthropy and gain respect and influential relations with local corporate elites. Atkinson and Galaskiewicz (1988) show that the percentage of equity ownership of CEOs is negatively related to company philanthropic contributions suggesting the CEOs stock ownership reduces agency costs of CSR. Similarly, Werbel and Carter (2002), using a sample of 160 corporate foundations, find that CEOs membership in charitable organizations is positively associated with corporate giving. Barnea and Rubin (2010) find that insiders tend to over-invest in CSR as they do not bear any cost but enjoy the benefits of enhanced personal reputations in the community.

On the other hand, the stakeholder theory (Freeman, 1984) contends that firm value is influenced by many stakeholders. It divides the stakeholders into investing (shareholders) and non-investing (employees, suppliers, customers, community etc.) stakeholders and argues that CSR enhances firm value by balancing the interests of all stakeholders and by reducing the risks of resource acquisitions (Backhaus, Stone, & Heiner, 2002; Haley, 1991). Ruf, Muralidhar, Brown, Janney, and Paul, (2001) find that changes in corporate social performance are positively related to firm financial performance. Brammer and Millington (2003) find that in a

[1] Fernández-Kranz and Santaló (2010) sample covers 1991–2005. Declerck and M'Zali (2012) sample is for the period 1995–2009 and Jia and Shi (2014) sample covers the 1991–2009 period.

sample of large UK companies higher levels of philanthropic expenditures have better reputations and this effect varies significantly across industries. Wang and Choi (2013) using KLD data find good stakeholder relations lead to higher financial performance.

Related to the stakeholder theory, the resource based view (RBV) theory argues that firm value depends on its competitive advantage. This competitive advantage comes from certain strategic resources which are rare, difficult to copy and have no close substitutes (Barney, 1991; Grant, 1991) and enables firms to create value by providing sustained and predictable financial cash flows (Russo & Fouts, 1997). McWilliams and Siegel (2011) assert that CSR builds firm goodwill and leads to enhanced reputation that can be considered a valuable strategic resource. Russo and Fouts (1997) show that environmental performance is positivity associated with firm financial performance. Ben Brik, Rettab, and Mellahi, (2011) find that CSR has a synergistic effect on the impact of market orientation on business performance. There are a number of studies that find CSR leads to higher credit ratings (Attig, El Ghoul, Guedhami, & Suh, 2013), lower cost of capital (El Ghoul, Guedhami, Kim, & Park, 2018; El Ghoul, Guedhami, Kwok, & Mishra, 2011) and lower market frictions (Attig, Cleary, El Ghoul, & Guedhami, 2014). The above discussion shows that CSR could have a positive or negative effect on firm value. I therefore form the following null hypothesis:

Hypothesis 1. CSR is not related to firm value.

2.2. Product market competition, CSR and firm value

Economic theory postulates that competition in product markets enforces discipline on risk averse and effort averse managers (Alchian, 1950; Hart, 1983; Schmidt, 1997; Stigler, 1958). Schmidt (1997) shows that an increase in market competition has two opposite effects on managerial incentives. When competition increases, the likelihood of failure and performance related job loss increases too. This “threat of liquidation” effect forces the effort averse managers to work hard in order to protect their jobs. On the other hand, increased competition lowers profits and the value of any cost reduction benefits of higher efforts. This “value-of-a-cost-reduction” effect induces managers not to work hard. The overall, effect may be ambiguous.

Competition in product markets influences the relation between CSR and firm value in a few distinct ways. First, CSR helps firms differentiate when competition increases. In competitive markets any competitive advantage results in higher market share. Fisman, Heal, and Nair, (2008) find that firms are more likely to invest in CSR in more competitive markets because the benefits from the differentiation strategy are huge. Declerck and M’Zali (2012) show that CSR engagement is higher in competitive markets. A number of other studies find that firms engage in strategic CSR in more competitive markets than in less competitive markets (Fisman et al., 2008; Siegel & Vitaliano, 2007; Fernández-Kranz & Santaló, 2010). Sheikh (2018) find that powerful CEOs invest more in innovation when they operate in more competitive markets.

Second, profit margins are thin in more competitive markets and there are fewer cash flows available for managers to divert to their personal benefits. Any investment in CSR made by managers when the competition is high represents an effort to increase firm value and to protect their jobs and not for extraction of rents. Jia and Shi (2014) find that social performance is positively related to firm value in competitive industries. Third, when competition is high managers are forced to focus on short run NPV positive projects that have direct effect on shareholder wealth instead of investing in long term projects like CSR. Ryu, Ryu, and Hwang, (2016) find that CSR has a significant positive effect on shareholder wealth only when product market competition is low.

The above discussion shows that competition in product markets significantly influences the relation between CSR and firm value leading to the following null hypothesis:

Hypothesis 2. Product market competition influences the relation between CSR and firm value.

2.3. Product fluidity, CSR and firm value

Product fluidity measures the change in a firm’s product space due to moves made by a firm’s rivals in the product markets (Hoberg et al., 2014). It is constructed on the basis of similarity between a firm’s vocabulary and the change in the overall use of vocabulary by competitors. Greater similarity implies that a firm faces greater threats from its rivals. It essentially measures threats posed by competitors in the same market. Product fluidity is a forward looking measure of competition in the market. Higher threats and higher levels of product fluidity represent increased expected competition. Like product market competition, product fluidity helps in differentiating the motive for investment in CSR. Since the expected effect of CSR on firm value is similar to that of increased product market competition, it leads to the following null hypothesis:

Hypothesis 3. Product fluidity influences the relation between CSR and firm value.

3. Data and measurement

Following previous studies I use the MSCI (formerly KLD) database to measure corporate social responsibility (CSR). The MSCI database is the most widely used dataset in CSR studies and covers companies in S&P 500 and Russell 3000 index. Although the data started its coverage in 1991, the most comprehensive coverage however started in 2003. I therefore create a sample of companies for the period 2003–2015. The MSCI dataset provides information on social performance in seven different dimensions as strengths or concerns. The seven dimensions of social performance included in the data are community, diversity, employees, product, environment, governance and human rights. In each dimension, CSR strengths represent actions that have positive effect on social

performance while concerns represent actions that have negative effect on social performance. Following previous studies (Gregory, Tharyan, & Whittaker, 2014; Harjoto & Laksmana, 2016) I exclude governance and human rights categories. I exclude human rights measure because it is available only for a small fraction of firms and for its focus on non-US operations. I also exclude governance because the dataset focuses more on social aspects of governance and is measured differently than traditional governance measures. Instead, I include board size, board structure and CEO duality to control for traditional measures of governance. Net CSR is measured as the difference between total CSR strengths and total CSR concerns on five dimensions (community, diversity, employees, product and environment).

Firm value is measured by Tobin's Q which is calculated as the market value of assets divided by the book value of assets. The market value of assets is the market value of equity plus the book value of assets minus the book value of common equity net of deferred taxes. It is the most commonly used measure of firm value (Bebchuk, Cohen, & Ferrell, 2009; Gompers, Ishi, & Metrick, 2003). Following previous studies, I subtract median industry Tobin's Q using two-digits SIC industry classification (Garcia-Castro, Ariño, & Canela, 2010). The resulting measure is industry adjusted and independent of any observable characteristics that affect firm value of all firms in an industry (Campa & Kedia, 2002).

I use Hoberg and Phillips (2016) text-based industry concentration index as a primary measure of product market competition. They use 10-K text-based network industries (TNIC) classification to construct Herfindahl index (TNICHHI) of market power.[2] According to Hoberg and Phillips, "[the] Industry Classifications have a spatial representation. All firms have a location in a product market space shaped as a unit sphere. Competitive product markets are areas of the sphere where many firms are located. Concentrated areas are sparsely populated." High (low) competition sample includes those firm year observations where (1-TNICHHI) is higher (lower) than sample median.

I also use Lerner index following Aghion, Reenen, and Zingales, (2013) to create an additional measure of market competition to check the robustness of my results. The Lerner index is calculated as the industry median gross margins of all firms in the Compustat dataset using 2-digits SIC industry classification. Firms in more competitive industries have lower gross margins. High (low) competition sample includes those firm year observations where (1-Lerner index) is higher (lower) than sample median.

Moreover, I use product market fluidity index of Hoberg et al. (2014) to measure threats and instabilities arising from the actions of competitors. Greater fluidity represents increased threats and increased competition in the product markets. High (low) fluidity sample equals 1 if firm level fluidity is greater (less) than sample median fluidity.

Information on firm financial characteristics is collected from Compustat database. Data on corporate governance (board size and independence) are from Institutional Shareholders' Services (formerly RiskMetrics). Data on CEO duality is drawn from Execucomp database. CEO duality equals 1 if CEO is also the chair of the board and 0 otherwise. After merging Compustat with the MSCI dataset, the sample consists of 17,104 firm year observations for the period 2003–2015. The actual number of observations used in each regression is different due to missing observations on some independent variables.

4. Empirical methodology

Most of the previous studies on the relation between CSR and firm value treat CSR as an exogenous variable.[3] However, Garcia-Castro et al. (2010) argue that endogeneity of CSR is a leading contributor to the mixed and conflicting results. Though most of the studies recognize the endogeneity of CSR in the relationship between CSR and firm value, few have explicitly dealt with this issue. In this study, I test for endogeneity using Durbin-Wu-Hausman (Durbin, 1954; Hausman, 1978; Wu, 1973) tests. The tests show that CSR is endogenous. OLS estimates in the presence of endogeneity are biased and inconsistent. I therefore use IV-GMM regressions to estimate the relation between CSR and firm value. The IV-GMM estimation implements two-step efficient generalized method of moments (GMM) estimator and generates efficient estimates of the coefficients as well as consistent estimates of the standard errors.[4]

The IV-GMM estimation depends on finding valid and relevant instruments that are correlated with CSR but not directly related to firm value. Deng, Kang, and Low, (2013) use two unique instrumental variables that affect CSR but have no direct effect on firm's acquisition decisions. The first variable is the religion rank of the state where the firm is located. Angelidis and Ibrahim (2004) find that the degree of religiousness is positively associated with the attitudes towards economic ethical components of CSR. A higher ranking in religiousness measures the degree of religiousness. It is calculated as the ratio of the religious adherents to the total population in the state where the firm is located.[5]

The second instrument is a binary variable that equals 1 if the firm headquarters are located in a blue (Democratic) state and 0 otherwise based on 2012 US presidential elections. There is empirical evidence that firms located in a blue (Democratic) state tend to have higher CSR ratings (Rubin, 2008). Hence, the blue (Democratic) state dummy is directly related to CSR but is not expected to have any direct effect on firm value.

I use instrumental variable (IV-GMM) method to estimate the relation between CSR and firm value using religion rank and blue state as instrumental variables. I also test the presence of endogeneity after running the IV-GMM regressions. The Durbin-Wu-Hausman (Durbin, 1954; Hausman, 1978; Wu, 1973) tests indicate that CSR is indeed endogenous.

[2] The TNICHHI data are available at http://hobergphillips.usc.edu/industryconcen.htm.

[3] Margolis and Walsh (2003) show that in a comprehensive survey of 127 empirical studies done during the period 1972–2002, 109 of these studies (85.8%) treat CSR as an independent variable predicting financial performance.

[4] STATA executes this estimation with the ivreg2, gmm2s robust command. For more details please see Baum, Schaffer, and Stillman, (2003).

[5] The data on religion rankings is from the US Religion Census and is available at http://www.rcms2010.org/compare.php.

Table 1
Summary statistics.

Variables	Mean	Median	Std. Dev.	Minimum	Maximum	Observations
CSR	0.165	0.000	−9.000	17.000	2.444	19171
CSR strengths	1.584	1.000	0.000	21.000	2.462	19171
CSR concerns	1.420	1.000	0.000	13.000	1.616	19171
Adjusted CSR	−0.084	−0.075	−2.726	3.095	0.537	19171
Adjusted Tobin Q	0.354	0.000	−2.178	145.792	1.737	20332
Adjusted ROA	−0.014	0.000	−32.847	46.384	0.567	20711
Sales ($ millions)	6150	1413	0.000	474259	19513	20712
Leverage	0.242	0.197	0.000	120.943	1.021	22149
R&D intensity	0.136	0.000	0.000	366.780	4.173	20660
Advertising intensity	0.012	0.000	0.000	2.097	0.042	22372
Capital expenditures	0.042	0.027	−0.033	0.744	0.052	22415
Board size	9.209	9.000	0.000	20.000	2.391	20343
Board independence	0.746	0.778	0.000	1.000	0.140	20340
CEO duality	0.327	0.000	0.000	1.000	0.469	22415

CSR is total CSR strengths minus total CSR concerns on five dimensions (community, diversity, employees, product and environment). Adjusted CSR is the net score on adjusted CSR strengths minus adjusted CSR concerns. Tobin's Q is the market value of assets divided by the book value of assets. The market value of assets is the market value of equity plus the book value of assets minus the book value of common equity net of deferred taxes. It is net of industry median Tobin's Q. Adjusted ROA is net income divided by total assets net of industry median ROA. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. Leverage is total debt divided by total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board.

Table 2
Correlation matrix of independent variables.

		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
I	CSR	1.00													
II	CSR strengths	0.78*	1.00												
III	CSR concerns	−0.32*	0.34*	1.00											
IV	Adjusted CSR	0.91*	0.61*	−0.45*	1.00										
V	Adjusted Tobin Q	0.05*	0.01	−0.07*	0.05*	1.00									
VI	Adjusted ROA	0.06*	0.06*	−0.01	0.06*	−0.19*	1.00								
VII	Sales	0.16*	0.44*	0.43*	0.07*	−0.03*	0.01	1.00							
VIII	Leverage	−0.02*	0.04*	0.11*	−0.02*	0.69*	−0.34*	0.01	1.00						
IX	R&D intensity	−0.01	−0.01	−0.01	−0.01	0.04*	−0.22*	−0.01	0.02*	1.00					
X	Advertising intensity	0.04*	0.03*	−0.03*	0.04*	0.08*	0.01	−0.01	−0.01	−0.01	1.00				
XI	Capital expenditures	−0.07*	−0.02*	0.08*	−0.07*	0.05*	0.01	0.01	0.00	−0.02*	0.07*	1.00			
XII	Board size	0.24*	0.35*	0.18*	0.21*	−0.08*	0.02*	0.28*	0.01	−0.02*	−0.02*	−0.09*	1.00		
XIII	Board independence	0.14*	0.21*	0.09*	0.14*	−0.04*	0.01	0.10*	0.01	−0.01	−0.04*	−0.01	0.11*	1.00	
XIV	CEO duality	−0.06*	0.03*	0.13*	−0.07*	−0.01	0.01	0.04*	0.01	0.01	−0.01	0.04*	0.06*	−0.02*	1.00

CSR is total CSR strengths minus total CSR concerns on five dimensions (community, diversity, employees, product and environment). Adjusted CSR is the net score on adjusted CSR strengths minus adjusted CSR concerns. Tobin's Q is the market value of assets divided by the book value of assets. The market value of assets is the market value of equity plus the book value of assets minus the book value of common equity net of deferred taxes. It is net of industry median Tobin's Q. Adjusted ROA is net income divided by total assets net of industry median ROA. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. Leverage is total debt divided by total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board.

* Significant at 5% or 1% level.

The dependent variable is the industry adjusted Tobin's Q which is independent of any observable characteristics that affect firm value of all firms in an industry (Campa & Kedia, 2002; Garcia-Castro et al., 2010). Besides CSR, I use a number of other control variables that are known to influence firm value. These control variables include firm size, leverage, R&D, capital and advertising expenditures. I use log of sales to control for firm size. The results remain similar if I use log of total assets. Leverage is calculated as the total debt divided by the book value of total assets. Following McWilliams and Siegel (2000) I include R&D intensity measured as the log of the ratio of R&D expenditures to sales. I also include log of capital and advertising expenditures scaled by total assets following Chang and Zhang (2015). There are a number of missing observations on both R&D and advertising expenditures in the data. Following previous work, missing values of R&D and advertising expenditures are replaced with 0. However, to control for the systematic effect of missing observations, two dummy variables (R&D missing and Adexp missing) that equal 1 if R&D/advertising expenditures are missing and 0 otherwise are included in all regressions.

Since corporate governance has significant effect on firm value. I include board size, board independence and CEO duality to control for differences in corporate governance. Larger boards are expected to be less efficient in making decisions but more difficult

Table 3
CSR and firm value: Benchmark regressions.

	CSR		CSR strengths		CSR concerns	
Variables	First stage	Second stage GMM	First stage	Second stage GMM	First stage	Second stage GMM
Religion rank	0.0035**		0.0022		−0.0014	
	(0.041)		(0.138)		(0.202)	
Blue state (dummy)	0.4405***		0.2766***		-0.1639***	
	(0.000)		(0.000)		(0.000)	
CSR (instrumented)		0.1456***		0.2317***	0.488554	−0.3900***
		(0.004)		(0.003)	(0.000)	(0.008)
Log (sales)	0.4614***	−0.1153***	0.9500***	−0.2684***	0.1066***	0.1425*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.057)
Leverage	−0.5125***	0.1240	−0.4059***	0.1478	0.1066*	0.0916
	(0.000)	(0.576)	(0.000)	(0.493)	(0.055)	(0.700)
Log (R&D)	2.1655***	1.3805***	2.8384***	1.0370***	0.6729***	1.9599***
	(0.000)	(0.000)	(0.000)	(0.003)	(0.000)	(0.000)
Log (adexp)	3.3333***	4.7313***	1.8430***	4.7916***	−1.4903***	4.6337***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Log (capexp)	2.4760***	3.3162***	1.8674***	3.2470***	−0.6085**	3.4418***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.024)	(0.000)
R&D missing	−0.3040***	−0.1190***	−0.3714***	−0.0773**	−0.0674**	−0.1895***
	(0.000)	(0.000)	(0.000)	(0.048)	(0.013)	(0.000)
Adexp missing	−0.3672***	−0.0246	−0.3280***	−0.0021	0.0393*	−0.0629***
	(0.000)	(0.398)	(0.000)	(0.953)	(0.086)	(0.008)
Board independence	1.1218***	−0.3328***	1.1537***	−0.4366***	0.0319	−0.1573**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.688)	(0.044)
Board size	0.1267***	−0.0583***	0.0972***	−0.0624***	−0.0295***	−0.0513***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEO duality	−0.1614***	0.0494**	−0.0556	0.0387*	0.1057***	0.0671**
	(0.000)	(0.027)	(0.101)	(0.079)	(0.000)	(0.012)
K-Paap (Cragg-Donald)						
F statistic	64.113		37.737		21.122	
Hansen J statistic	0.197		0.182		0.184	
Observations	16358	16358	16358	16358	16358	16358

Results are from 2SLS (IV-GMM) regressions of the effect CSR on industry adjusted Tobin's Q. CSR is total CSR strengths minus total CSR concerns on five dimensions (community, diversity, employees, product and environment). Religion rank is the religion rank of the state where the firm is located. Blue state equals 1 if the firm is located in Democratic state based on 2012 presidential elections. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board. Both stage regressions include year and industry dummies.*, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

for the CEO to influence. Board size is measured by total number of directors on the board. Boards comprised of more outside directors are more independent in monitoring the CEO and the management. Board independence is measured by the ratio of outside directors to total directors on the board. Similarly, CEOs who are also the chair of their boards tend to wield greater influence on the board and are more likely to affect board monitoring quality. CEO duality is included in all regressions and equals 1 if CEO is also the chair of the board and 0 otherwise. Detailed description of all the variables used in this study is given in the Appendix A.

Table 1 provides summary statistics of all the variables. The average net CSR score is 0.1645 which shows that on average CSR strengths are greater than CSR concerns by 0.1645. The adjusted CSR which gives equal weights to all dimensions has an average score of −0.0837. The average industry adjusted Tobin's Q and ROA are 0.3538 and −0.0139 respectively. Average firm in the sample has sales of $6.15 billion and has a leverage ratio of 0.2417. Average R&D intensity is 0.1362 and average advertising and capital expenditures are 0.0121 and 0.0420 respectively. The average firm has 9 directors on its board and 75% of them are independent. The CEO is the chair of the board approximately 33% of the time.

Table 2 provides the correlation matrix of all variables. In general there does not seem to be any concerns about high correlations among the independent variables.

5. Results

5.1. CSR and firm value

Table 3 provides results from instrumental variable (IV-GMM) estimation of the effect of CSR on firm value. Columns 1, 3 & 5 provide coefficients from first stage regressions that use religion rank and blue state dummy as instruments. The coefficients on religion rank of the state where the firm's headquarters are located are positive and significant in the first stage regressions of CSR and positive but insignificant in CSR strengths and concerns. The coefficients on blue (Democratic) state dummy are positive and

Table 4
CSR, firm value and product market competition.

	High competition		Low competition	
Variables	First stage	Second stage GMM	First stage	Second stage GMM
Religion rank	0.0038		0.0061**	
	(0.113)		(0.012)	
Blue state (dummy)	0.4330***		0.4097***	
	(0.000)		(0.000)	
CSR (instrumented)		0.2345***		0.0092
		(0.000)		(0.913)
Log (sales)	0.5024***	−0.1404***	−0.3654***	−0.0950***
	(0.000)	(0.000)	(0.000)	(0.004)
Leverage	−0.4678***	0.0709	−0.3654***	0.4393
	(0.000)	(0.693)	(0.001)	(0.272)
Log (R&D)	1.8623***	0.9466***	2.9513***	2.6080***
	(0.000)	(0.000)	(0.000)	(0.005)
Log (adexp)	4.5532***	3.5099***	3.1513***	5.2357***
	(0.000)	(0.000)	(0.000)	(0.000)
Log (capexp)	3.2287***	1.7701***	1.3634**	4.9695***
	(0.000)	(0.000)	(0.020)	(0.000)
R&D missing	−0.2614***	−0.1192**	−0.3818***	−0.1573***
	(0.000)	(0.020)	(0.000)	(0.001)
Adexp missing	−0.5289***	0.0672	−0.2068***	−0.1001***
	(0.000)	(0.158)	(0.000)	(0.003)
Board independence	1.1981***	−0.4800***	1.1126***	−0.1484
	(0.000)	(0.000)	(0.000)	(0.218)
Board size	0.1243***	−0.0640***	0.1345***	−0.0350***
	(0.000)	(0.000)	(0.000)	(0.008)
CEO duality	−0.1505*	0.0544*	−0.1721***	0.0314
	(0.010)	(0.080)	(0.000)	(0.339)
K-Paap (Cragg-Donald)				
F statistic	27.511		31.865	
Hansen J statistic	0.442		1.372	
Observations	7814	8544	7814	8544

Results are from 2SLS (IV-GMM) regressions of the effect CSR on industry adjusted Tobin's Q. CSR is total CSR strengths minus total CSR concerns on five dimensions (community, diversity, employees, product and environment). High (low) competition sample includes those firm year observations where (1-TNICHHI) is higher (lower) than sample median. Religion rank is the religion rank of the state where the firm is located. Blue state equals 1 if the firm is located in Democratic state based on 2012 presidential elections. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board. Both stage regressions include year and industry dummies.*, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

significant in CSR, CSR strengths and CSR concerns.

The second stage regressions use instrumented CSR from the first stage regressions to estimate the effect of CSR on firm value. The coefficients on instrumented CSR (CSR strengths) are positive and significant indicating that CSR is a value increasing investment. The coefficient on instrumented CSR concerns is negative indicating that an increase in CSR concerns reduces firm value. These results reject Hypothesis 1 that postulates that CSR is not related to firm value.

The coefficients on other control variables are also according to the expectations. Firm size is negatively related to firm value in net CSR and CSR strengths regressions and positively related to CSR concerns regressions. R&D, advertising and capital expenditures have positive effect on long run firm value. Board size and board independence are negatively associated with firm value and CEO duality has a positive and significant effect on firm value.

Table 3 also provides test statistics for weak and over identification to check the validity and relevance conditions of the instruments used in the first stage. The weak identification test statistic is Kleibergen-Paap (Cragg-Donlad) F-statistic. The F-statistics are greater than the Stock-Yogo's critical values (Stock, Wright, & Yogo, 2002) at every level rejecting the hypothesis that the instruments used in the first stage regressions are weak or under-identified. The Hansen J statics are statistically insignificant in all three specifications rejecting the hypothesis of over-identification. Thus the instrumental variables used in the estimation satisfy both the validity and relevancy conditions.

5.2. CSR, product market competition and firm value

In order to examine the effect of competition on the relation between CSR and firm value, I divide the sample into high and low competition sub-samples. High (low) competition sample includes all those firm year observations where (1-TNICHHI) is higher (lower) than sample median. Results are provided in Table 4. The coefficients on blue state dummy are positive and significant in

Table 5
CSR, firm value and product fluidity.

	High fluidity		Low fluidity	
Variables	First stage	Second stage GMM	First stage	Second stage GMM
Religion rank	0.0035		0.0069*	
	(0.118)		(0.080)	
Blue state (dummy)	0.4654***		0.4165***	
	(0.000)		(0.000)	
CSR (instrumented)		0.2989***		0.0344
		(0.000)		(0.628)
Log (sales)	0.4831***	−0.2083***	0.4364***	−0.0467*
	(0.000)	(0.000)	(0.000)	(0.098)
Leverage	−0.3984***	0.0183	−0.5548***	0.5578
	(0.000)	(0.909)	(0.000)	(0.217)
Log (R&D)	1.6798***	0.4365*	4.6888***	4.2904***
	(0.000)	(0.068)	(0.000)	(0.002)
Log (adexp)	1.1052	5.3517***	4.9690***	5.3018***
	(0.178)	(0.000)	(0.000)	(0.000)
Log (capexp)	3.1512***	2.1766***	1.5156**	4.5179***
	(0.000)	(0.000)	(0.023)	(0.000)
R&D missing	−0.3572***	−0.1014*	−0.2295***	−0.0154
	(0.000)	(0.070)	(0.000)	(0.725)
Adexp missing	−0.4689***	0.0767	−0.2516***	−0.0433
	(0.000)	(0.102)	(0.000)	(0.192)
Board independence	1.1020***	−0.4564***	1.1616***	−0.2875***
	(0.000)	(0.001)	(0.000)	(0.009)
Board size	0.1228***	−0.0836***	0.1369***	−0.0350***
	(0.000)	(0.000)	(0.000)	(0.002)
CEO duality	−0.2469***	0.1036***	−0.0516	0.0163
	(0.000)	(0.007)	(0.342)	(0.546)
K-Paap (Cragg-Donald)				
F statistic	31.755		32.4060	
Hansen J statistic	1.202		1.8400	
Observations	7701	8657	7701	8657

Results are from 2SLS (IV-GMM) regressions of the effect CSR on industry adjusted Tobin's Q. CSR is total CSR strengths minus total CSR concerns. High (low) fluidity sample includes those firm year observations where product fluidity is higher (lower) than sample median. Religion rank is the religion rank of the state where the firm is located. Blue state equals 1 if the firm is located in Democratic state based on 2012 presidential elections. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board. Both stage regressions include year and industry dummies.*, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

both high and low competition samples. The coefficients on religion rank are positive but significant only in low competition sample. All other control variables in the first stage regressions have coefficients that are similar to the benchmark regressions. The test statistics for weak and over-identification show that the instruments used in the first stage regressions are valid and relevant.

The coefficient on CSR (instrumented) is positive and significant at 1% level in the high competition sample. However, the coefficient on CSR (instrumented) is not statistically significant at any acceptable level in the low competition sample indicating that CSR is not related to firm value in low competition markets. The results in this table provide support to Hypothesis 2 by showing that competition in product markets influences the relation between CSR and firm value.

The coefficients on all other control variables in Table 4 have signs and significance similar to the benchmark regressions. Firm size is negatively associated with firm value. R&D, advertising and capital expenditures have a positive and significant effect on firm value in both high and low competition samples. Board size is negatively related to firm value in both samples. However, board independence and CEO duality are significant only in high competition sample. Overall, the results in this table show that CSR is a value increasing investment only when managers face discipline from high competition markets.

5.3. CSR, product fluidity and firm value

Like competition in product markets, product fluidity represents threats from competitors and a pressure on managers. To test the effect of product fluidity on the relation between CSR and firm value, I divide the sample into two sub-samples. High (low) fluidity sample includes all firm year observations where product market fluidity is greater (lower) than the sample median product fluidity.

Table 5 reports results from this specification. The coefficients on the two instruments used in the first stage regressions are similar to the product market competition regressions in Table 4. The weak and over-identification tests also show that the instruments used meet the validity and relevance conditions. The coefficient on CSR (instrumented) is positive and significant at 1% level in high fluidity sample. However, the coefficient on CSR (instrumented) is positive but not significant in low fluidity sample. These

Table 6
CSR, firm value and competition: CSR strengths and concerns.

	Second stage GMM			
Variables	High competition		Low competition	
CSR strengths	0.2694***		0.1379	
	(0.000)		(0.384)	
CSR concerns		−0.5028		0.0602
		(0.181)		(0.618)
Log (sales)	−0.2792***	0.2068	−0.2151	−0.1248*
	(0.000)	(0.243)	(0.131)	(0.067)
Leverage	0.0697	−0.0207	0.2293	0.5136
	(0.697)	(0.954)	(0.587)	(0.143)
Log (R&D)	0.7394***	2.0433***	1.7357	2.6996***
	(0.008)	(0.000)	(0.172)	(0.000)
Log (adexp)	3.6843***	3.8765***	4.9572***	5.4106***
	(0.000)	(0.005)	(0.000)	(0.000)
Log (capexp)	1.9376***	2.5893***	4.5483***	5.0981***
	(0.000)	(0.004)	(0.000)	(0.000)
R&D missing	−0.0947*	−0.0968	−0.1033	−0.1571***
	(0.080)	(0.255)	(0.166)	(0.000)
Adexp missing	0.0751	0.0518	−0.0793**	−0.1022***
	(0.120)	(0.612)	(0.046)	(0.001)
Board size	−0.5253***	0.0138	−0.2626	−0.1502
	(0.000)	(0.953)	(0.129)	(0.154)
Board independence	−0.0608***	−0.0292**	−0.0463***	−0.0318***
	(0.000)	(0.032)	(0.005)	(0.000)
CEO duality	0.0347	0.0906	0.0345	0.026
	(0.249)	(0.166)	(0.281)	(0.431)
K-Paap (Cragg-Donald)				
F statistic	32.222	11.1480	12.521	26.953
Hansen J statistic	0.224	2.233	0.63	1.123
Observations	7814	8544	7814	8544

Results are from second stage 2SLS (IV-GMM) regressions of the effect CSR on industry adjusted Tobin's Q. CSR is total CSR strengths minus total CSR concerns. High (low) competition sample includes those firm year observations where (1-TNICHHI) is higher (lower) than sample median. High (low) fluidity sample includes those firm year observations where product fluidity is higher (lower) than sample median. Religion rank is the religion rank of the state where the firm is located. Blue state equals 1 if the firm is located in Democratic state based on 2012 presidential elections. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board. Both stage regressions include year and industry dummies.*, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

results are similar to high and low competition samples in Table 4 and provide further support to Hypothesis 3 by showing that product fluidity influences the relation between CSR and value. The coefficients on all other control variables in the second stage GMM regressions have signs and significance similar to Table 4.

5.4. CSR, competition and firm value: strengths and concerns

The above regressions use a measure of CSR that is constructed by subtracting CSR concerns from CSR strengths. Strengths are actions that have positive effect on CSR while concerns are actions that have negative effect on CSR. Mattingly and Berman (2006) argue that CSR strengths and concerns are distinct constructs and should be evaluated separately. Fatemi, Glaum and Kaiser (2017) find that ESG strengths increase firm value while concerns reduce firm value. Sheikh (2017) reports that the negative relation between antitakeover provisions and CSR is driven by CSR strengths. It is therefore interesting to disentangle the effect of managerial entrenchment on CSR strengths and concerns.

In this section I run regressions of CSR strengths and concerns on high and low competition samples to see if the effect of product market competition changes in these sub-samples. Table 6 provides second stage GMM estimates of the effect of CSR strengths and concerns. First stage regression coefficients (not reported to save space) are similar to benchmark regressions. The coefficient on CSR strengths is positive and significant only in high competition sample. It is not significant in low competitions sample. On the other hand, the coefficients on CSR concerns are all insignificant in both high and low competition samples. It seems that the effect of CSR is driven by CSR strengths as CSR concern are not related to firm value in either high or low competition samples.

5.5. CSR, market competition and firm value: environmental vs social dimensions

Next, I divide CSR into environmental and social dimensions to see if the effect of market competition is driven by either of them. Results are provided in Table 7. First stage regression coefficients (not reported to save space) are similar to benchmark regressions.

Table 7
CSR, firm value and product market competition: Environmental and Social dimensions.

	Environmental dimension		Social dimension		Environmental dimension		Social dimension	
Variables	High competition	Low competition	High competition	Low competition	High fluidity	Low fluidity	High fluidity	Low fluidity
CSR (instrumented)	6.3026***	−0.7161	1.7189***	−0.0029	10.2424***	0.4934	1.6969***	0.5619
	(0.002)	(0.847)	(0.001)	(0.996)	(0.002)	(0.852)	(0.001)	(0.293)
Log (sales)	−0.1176***	−0.081	−0.1462***	−0.0759***	−0.2081***	−0.0427	−0.1744***	−0.0416
	(0.001)	(0.159)	(0.001)	(0.007)	(0.000)	(0.346)	(0.000)	(0.121)
Leverage	−0.0917	0.507	0.2119	1.1629***	−0.1299	0.6117	0.1252	1.1633***
	(0.609)	(0.214)	(0.200)	(0.000)	(0.440)	(0.199)	(0.425)	(0.000)
Log (R&D)	0.9616***	2.7887***	1.0645***	1.8044***	0.2986	4.5605***	0.7582**	2.3517**
	(0.000)	(0.002)	(0.000)	(0.005)	(0.338)	(0.002)	(0.011)	(0.011)
Log (capital exp.)	2.5826**	5.3611***	3.3807***	4.8233***	5.4934***	5.4156***	3.9789***	4.8355***
	(0.014)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log (ad. exp.)	1.6950***	5.1672***	2.0995***	5.5304***	1.3788*	4.6171***	2.9507***	5.0398***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.062)	(0.000)	(0.000)	(0.000)
R&D missing	0.0221	−0.1765*	−0.1232***	−0.2031***	0.1213	−0.0095	−0.1430***	−0.0197
	(0.807)	(0.050)	(0.009)	(0.000)	(0.321)	(0.862)	(0.007)	(0.620)
Advertising missing	0.0509	−0.1065***	0.0417	−0.1070***	0.1167*	−0.0489	−0.0004	−0.0513
	(0.311)	(0.007)	(0.372)	(0.003)	(0.099)	(0.127)	(0.993)	(0.201)
Board size	−0.3054**	−0.1246	−0.7058***	−0.141	−0.2941**	−0.2683***	−0.5200***	−0.4106***
	(0.010)	(0.359)	(0.000)	(0.298)	(0.045)	(0.008)	(0.002)	(0.004)
Board independence	−0.0551***	−0.0320**	−0.0764***	−0.0332**	−0.0551***	−0.0330**	−0.0909***	−0.0470***
	(0.000)	(0.012)	(0.000)	(0.044)	(0.000)	(0.016)	(0.000)	(0.002)
CEO duality	0.0788**	0.0215	0.0626**	0.0289	0.2029***	0.0175	0.1061***	0.0128
	(0.042)	(0.701)	(0.048)	(0.348)	(0.003)	(0.565)	(0.004)	(0.623)
K-Paap (Cragg-Donald)								
F statistic	10.445	8.3610	15.141	25.783	8.135	6.355	21.041	22.922
Hansen J statistic	1.277	1.339	0.549	0.089	0.917	2.022	1.066	0.138
Observations	7814	8544	8260	9355	7701	8657	8201	9414

Results are from second stage 2SLS (IV-GMM) regressions of the effect CSR on industry adjusted Tobin's Q. CSR is total CSR strengths minus total CSR concerns on environmental and social dimensions. Social dimensions include community, diversity and employee relations. High (low) competition sample includes those firm year observations where (1-TNICHHI) is higher (lower) than sample median. High (low) fluidity sample includes those firm year observations where product fluidity is higher (lower) than sample median. Religion rank is the religion rank of the state where the firm is located. Blue state equals 1 if the firm is located in Democratic state based on 2012 presidential elections. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board. Both stage regressions include year and industry dummies.*, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

Social dimensions include community, diversity, and employee relations. The coefficients on CSR (instrumented) in the second stage regressions are positive and significant only when market competition is high and not significant when competition is low. Similarly, CSR is positively related to firm value only when product fluidity is high and has no effect on firm value when product fluidity is low. These results show that the overall effect of CSR is not driven by either environmental or social dimensions. The coefficients on all other control variables have the signs and significance similar to the benchmark regressions.

5.6. CSR, market competition and firm value: individual dimensions

The overall CSR net scores are calculated from five social dimensions (community, diversity, employee, product and environment). It is important to separate the effect of individual social dimensions on firm value in order to examine the effect of market competition and product fluidity on the relation between social performance and firm value. Table 8 reports results from individual dimensions. Results show that community, diversity and environment dimensions of CSR have positive effect on firm value when competition is high and no effect when competition is low. Employee relations and product dimensions have no effect on firm value in either high or low competition markets. The results are similar in high and low product fluidity samples. Overall, it seems that the effect of market competition and product fluidity is driven by community, diversity and environment components of the CSR.

The coefficients on instruments in the first stage regressions and all other control variables in the second stage regressions are similar to benchmark regressions.

Table 8
CSR, firm value and product market competition: Individual components of the CSR.

	Community		Diversity		Employee relations		Product		Environment	
Variables	High competition	Low competition	High competition	Low competition	High competition	Low competition	High competition	Low competition	High competition	Low competition
CSR (instrumented)	3.2712***	−2.0734	1.8818***	−0.0497	−6.5182	3.8711	8.506	−0.5342	6.3026***	−0.7161
	(0.005)	(0.442)	(0.000)	(0.936)	(0.121)	(0.350)	(0.113)	(0.786)	(0.002)	(0.847)
Log (sales)	−0.0716***	−0.0764***	−0.1584***	−0.0899**	0.0432	−0.0777***	0.2937	−0.1061*	−0.1176***	−0.081
	(0.001)	(0.002)	(0.000)	(0.010)	(0.375)	(0.000)	(0.144)	(0.054)	(0.001)	(0.159)
Leverage	−0.0101	0.4559	−0.0236	0.519	−0.5790**	0.3665	−0.0917	0.5066	−0.0917	0.507
	(0.955)	(0.185)	(0.891)	(0.218)	(0.047)	(0.312)	(0.646)	(0.175)	(0.609)	(0.214)
Log (R&D)	1.1894***	2.8360***	0.9638***	2.6283***	1.7588***	2.0897**	1.9869***	2.7236***	0.9616***	2.7887***
	(0.000)	(0.000)	(0.000)	(0.003)	(0.000)	(0.024)	(0.000)	(0.000)	(0.000)	(0.002)
Log (capital exp.)	3.4956***	5.6341***	4.1647***	5.1028***	3.6709***	4.8385***	5.6752***	5.2621***	2.5826**	5.3611***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.014)	(0.000)
Log (ad. exp.)	2.1546***	4.9021***	2.3489***	5.1141***	1.3889***	4.4690***	2.1336***	5.1366***	1.6950***	5.1672***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
R&D missing	−0.1566***	−0.1912***	−0.1416***	−0.1690***	−0.2771***	−0.1343***	−0.2074***	−0.1611***	0.0221	−0.1765*
	(0.001)	(0.001)	(0.003)	(0.000)	(0.000)	(0.005)	(0.001)	(0.000)	(0.807)	(0.050)
Advertising missing	−0.0089	−0.1217***	0.0248	−0.0921***	−0.2125**	−0.0778*	0.0236	−0.0984***	0.0509	−0.1065***
	(0.815)	(0.003)	(0.537)	(0.004)	(0.028)	(0.062)	(0.741)	(0.003)	(0.311)	(0.007)
Board size	−0.3475***	−0.0927	−0.6566***	−0.0951	0.0027	−0.0628	−0.0672	−0.1355	−0.3054**	−0.1246
	(0.004)	(0.456)	(0.000)	(0.541)	(0.988)	(0.653)	(0.687)	(0.201)	(0.010)	(0.359)
Board independence	−0.0529***	−0.0249*	−0.0725***	−0.0363**	−0.0211**	−0.0353***	−0.0651***	−0.0337***	−0.0551***	−0.0320**
	(0.000)	(0.084)	(0.000)	(0.037)	(0.021)	(0.000)	(0.004)	(0.000)	(0.000)	(0.012)
CEO duality	0.0219	0.0295	0.0301	0.0266	−0.0582	0.0674	0.1286	0.0315	0.0788**	0.0215
	(0.480)	(0.374)	(0.324)	(0.416)	(0.369)	(0.196)	(0.113)	(0.325)	(0.042)	(0.701)
K-Paap (Cragg-Donald)										
F statistic	11.474	5.9010	29.978	40.828	10.912	5.857	5.226	10.295	10.445	8.3610
Hansen J statistic	4.142	0.682	0.061	0.978	2.415	0.315	3.345	1.299	1.277	1.339
Observations	7814	8544	7216	7914	7814	8544	7814	8544	7814	8544

Results are from second stage 2SLS (IV-GMM) regressions of the effect CSR on industry adjusted Tobin's Q. CSR is total CSR strengths minus total CSR concerns on community, diversity, employee relations, product and environment dimensions. High (low) competition sample includes those firm year observations where (1-TNICHHI) is higher (lower) than sample median. Religion rank is the religion rank of the state where the firm is located. Blue state equals 1 if the firm is located in Democratic state based on 2012 presidential elections. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board. Both stage regressions include year and industry dummies.*, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

Table 9
CSR, firm value and product market competition: using alternative definition of competition.

	High competition		Low competition	
Variables	First stage	Second stage GMM	First stage	Second stage GMM
Religion rank	0.0116*		−0.0054	
	(0.096)		(0.416)	
Blue state (dummy)	0.4156**		0.5462***	
	(0.002)		(0.001)	
CSR (instrumented)		0.3125**		0.0498
		(0.042)		(0.771)
Log (sales)	0.3482***	−0.1509***	0.5721***	−0.0797
	(0.000)	(0.009)	(0.000)	(0.410)
Leverage	−0.6198**	0.2423	−0.7075***	0.3559
	(0.025)	(0.547)	(0.009)	(0.587)
Log (R&D)	8.4542***	0.4436	1.9541***	1.2067***
	(0.000)	(0.820)	(0.000)	(0.010)
Log (adexp)	3.2110	4.6858***	2.3149	4.3332***
	(0.101)	(0.000)	(0.172)	(0.001)
Log (capexp)	−0.3933	4.2551***	1.1416	1.6014***
	(0.761)	(0.000)	(0.258)	(0.003)
R&D missing	−0.1975	0.0993	−0.6065***	−0.1536
	(0.108)	(0.187)	(0.000)	(0.405)
Adexp missing	−0.3441**	0.1205	−0.5214***	−0.1713
	(0.014)	(0.173)	(0.000)	(0.160)
Board independence	1.1884***	−0.3865	0.8585	−0.2935
	(0.001)	(0.165)	(0.160)	(0.269)
Board size	0.1745***	−0.0739**	0.0704**	−0.0625**
	(0.000)	(0.030)	(0.041)	(0.014)
CEO duality	−0.1582	−0.0700	0.1757	0.1938**
	(0.133)	(0.237)	(0.110)	(0.016)
K-Paap (Cragg-Donald)				
F statistic	33.081		34.478	
Hansen J statistic	1.006		0.1690	
Observations	6981	6981	6712	6712

Results are from 2SLS (IV-GMM) regressions of the effect CSR on industry adjusted Tobin's Q. CSR is total CSR strengths minus total CSR concerns. High (low) competition sample includes those firm year observations where (1-Lerner index) is higher (lower) than sample median. Religion rank is the religion rank of the state where the firm is located. Blue state equals 1 if the firm is located in Democratic state based on 2012 presidential elections. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board. Both stage regressions include year and industry dummies.*, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

6. Robustness

6.1. CSR, competition and firm value: using alternative definition of competition

The above analysis uses Hoberg and Phillips (2016) text based Herfindahl index of market concentration as a primary measure of competition. In order to test the robustness of the empirical results, I use Lerner index to construct an alternative measure of competition following Aghion et al. (2013). High (low) competition sample includes those firm year observations where (1-Lerner index) is higher (lower) than sample median.

Results are provided in Table 9. The coefficients on first stage regressions are similar to benchmark regressions. The validity and relevance conditions of the instruments used are met too. The coefficient on CSR (instrumented) is positive and significant in high competition sample and positive but insignificant in low competition sample. These results provide further support to the results given in Table 4. Using an alternative method for constructing market competition does not change the effect of competition on the relation between CSR and firm value.

6.2. CSR, competition and firm value: using alternative definition of CSR

The above regressions measure CSR as the difference between total CSR strengths and total CSR concerns on five social dimensions. Most of the previous studies use this method of constructing CSR. However, there are a few studies that argue that the number of strengths and concerns are different in each dimension and subtracting total number of concerns from total number of strengths gives unequal weights to each dimension (Manescue, 2009; Deng et al., 2013). They suggest dividing strengths and concerns in each dimension by total number of strengths and concerns in that dimension and then taking a difference between total number of adjusted strengths and adjusted concerns. The resulting measure is called net adjusted CSR. In order to check the

Table 10
CSR, firm value and competition: using alternative definition of CSR.

	Second stage GMM			
Variables	High competition	Low competition	High fluidity	Low fluidity
Adjusted CSR (instrumented)	1.1598***	−0.0348	1.4381***	0.0711
	(0.001)	(0.924)	(0.000)	(0.826)
Log (sales)	−0.1032***	−0.0904***	-0.1570***	−0.0374**
	(0.000)	(0.000)	(0.000)	(0.041)
Leverage	0.0596	0.4807	−0.0021	0.6185
	(0.739)	(0.213)	(0.990)	(0.161)
Log (R&D)	1.0683***	2.7195***	0.5603**	4.5897***
	(0.000)	(0.001)	(0.015)	(0.000)
Log (adexp)	3.5666***	5.3117***	5.1436***	5.4423***
	(0.000)	(0.000)	(0.000)	(0.000)
Log (capexp)	1.8632***	5.0447***	2.2962***	4.6388***
	(0.000)	(0.000)	(0.000)	(0.000)
R&D missing	−0.1189**	−0.1633***	−0.1139**	−0.0141
	(0.023)	(0.000)	(0.044)	(0.752)
Adexp missing	0.0444	−0.1026***	0.0454	−0.0485
	(0.324)	(0.001)	(0.300)	(0.126)
Board size	−0.5659***	−0.1343	−0.5521***	−0.2778**
	(0.000)	(0.297)	(0.000)	(0.020)
Board independence	−0.0701***	−0.0328**	−0.0923***	−0.0328***
	(0.000)	(0.017)	(0.000)	(0.005)
CEO duality	0.0649**	0.0299	0.1101***	0.0152
	(0.047)	(0.352)	(0.006)	(0.573)
K-Paap (Cragg-Donald)				
F statistic	20.744	31.3760	24.9680	30.092
Hansen J statistic	1.298	1.3690	2.3160	2.013
Observations	7814	8544	7701	8657

Results are from second stage 2SLS (IV-GMM) regressions of the effect CSR on industry adjusted Tobin's Q. Adjusted CSR is total adjusted CSR strengths minus total adjusted CSR concerns. High (low) competition sample includes those firm year observations where (1-TNICHHI) is higher (lower) than sample median. High (low) fluidity sample includes those firm year observations where product fluidity is higher (lower) than sample median. Religion rank is the religion rank of the state where the firm is located. Blue state equals 1 if the firm is located in Democratic state based on 2012 presidential elections. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board. Both stage regressions include year and industry dummies.*, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

robustness of the results to a change in the method of CSR construction, I use net adjusted CSR to estimate the effect of competition on the relation between CSR on firm value.

Table 10 gives results of the second stage regressions using IV-GMM method. The unreported coefficients on first stage regressions are similar in signs and significance to the coefficients reported in Tables 4 and 5. The coefficients on the instrumented adjusted CSR are positive and significant only in high competition and high fluidity samples and are insignificant in low competition and low fluidity samples. These results show that the empirical results in Tables 4 and 5 are robust to a change in the method of construction of CSR. The coefficients on all other control variables have signs and significance similar to those of the benchmark regressions.

6.3. CSR, competition and firm value: separating pre and post financial crises periods

The sample period used in this study expands between 2003 and 2015 and includes both pre and post financial crisis periods. In order to check if the effect of market competition on the relation between CSR and firm value significantly changes between these two periods, I divide the sample into two sub-samples (2003–2008 and 2009–2015). Results from the two sub-periods are given in Table 11. The coefficients on CSR (instrumented) from the second stage IV-GMM regressions show that CSR is positively related to firm value only when market competition (product fluidity) is high and are not significant when market competition (product fluidity) is low. These results show that the effect of market competition on the relation between CSR and firm value is stable over the full sample period and is not affected by the financial crisis.

6.4. CSR, competition and firm value: using alternative definition firm value

The above analysis uses industry adjusted Tobin's Q which is the most widely used measure of firm value. However, in order to check if the benchmark results are sensitive to a change in the definition of firm value, I calculate firm value as industry adjusted return on assets (ROA). Results from IV-GMM regressions (not reported here to save space) show that CSR has positive and significant effect on firm value only when competition is high and product fluidity is high indicating that the benchmark results are not sensitive

Table 11
CSR, firm value and competition: dividing the sample period in to two sub-periods.

	2003–2008		2009–2015		2003–2008		2009–2015	
Variables	High competition	Low competition	High competition	Low competition	High Fluidity	Low Fluidity	High Fluidity	Low Fluidity
CSR (instrumented)	0.2112**	0.0903	0.2637**	0.1245	0.2267**	0.0757	0.3203***	0.0696
	(0.021)	(0.559)	(0.022)	(0.484)	(0.024)	(0.592)	(0.003)	(0.682)
Log (sales)	−0.0687**	−0.1280***	−0.2130***	−0.1656*	−0.1098***	−0.0598**	−0.2926***	−0.0751
	(0.012)	(0.001)	(0.010)	(0.097)	(0.001)	(0.047)	0.000	(0.415)
Leverage	−0.2404	0.6174	0.4833**	−0.2309	−0.374	0.9306	0.5058**	−0.208
	(0.403)	(0.518)	(0.043)	(0.356)	(0.196)	(0.361)	(0.014)	(0.444)
Log (R&D)	0.8396***	1.8844	1.4529***	0.9963	0.5066**	5.047	1.1566**	0.7948
	(0.001)	(0.271)	(0.005)	(0.397)	(0.023)	(0.189)	(0.018)	(0.589)
Log (capital exp.)	4.4642***	3.6812***	3.0673***	5.6551***	6.5055***	3.7213***	5.1826***	5.2497***
	(0.004)	(0.000)	(0.009)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Log (ad. exp.)	1.5438***	3.9297***	2.5424***	3.8613***	1.7748***	4.1696***	2.6466***	3.5665***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.004)	(0.000)	(0.000)
R&D missing	−0.0609	0.0036	−0.0155	0.0529	−0.0737	0.1395*	−0.0488	−0.0002
	(0.450)	(0.970)	(0.875)	(0.544)	(0.408)	(0.096)	(0.615)	(0.998)
Advertising missing	0.0964	−0.0558	0.0887	−0.0861	0.09	−0.0473	0.0653	−0.0332
	(0.273)	(0.547)	(0.240)	(0.244)	(0.341)	(0.646)	(0.326)	(0.603)
Board size	−0.1257	−0.103	−0.6721**	−0.4334	0.0195	−0.3119	−0.7408***	−0.3966
	(0.538)	(0.666)	(0.012)	(0.211)	(0.930)	(0.163)	(0.004)	(0.215)
Board independence	−0.0578***	−0.0449*	−0.0564***	−0.0256	−0.0655***	−0.0376*	−0.0811***	−0.0178
	(0.002)	(0.058)	(0.004)	(0.528)	(0.000)	(0.093)	(0.000)	(0.629)
CEO duality	0.0389	0.0448	0.0355	−0.0007	0.0388	0.0346	0.1525**	−0.0258
	(0.500)	(0.539)	(0.495)	(0.992)	(0.552)	(0.585)	(0.021)	(0.704)
K-Paap (Cragg-Donald)								
F statistic	32.699	28.9360	9.291	14.271	11.849	7.851	11.967	13.125
Hansen J statistic	1.232	0.141	3.038	0.335	0.061	0.195	0.514	1.059
Observations	3810	4041	4004	4503	3967	3884	3734	4773

Results are from second stage 2SLS (IV-GMM) regressions of the effect CSR on industry adjusted Tobin's Q. Net CSR is total CSR strengths minus total CSR concerns on five dimensions (community, diversity, employees, product and environment). Religion rank is the religion rank of the state where the firm is located. Blue state equals 1 if the firm is located in Democratic state based on 2012 presidential elections. RD intensity is R&D expenditure to sales. Advexp is the ratio of advertising expenses to total assets. Capexp is the ratio of capital expenditures to total assets. R&D missing equals 1 if R&D expenditures are missing and 0 otherwise. Adexp missing equals 1 if advertising expenses are missing and 0 otherwise. Board independence is the ratio of outside directors to total directors. Board size is total number of directors on the board. Both stage regressions include year and industry dummies.*, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

to a change in the definition of firm value.

6.5. CSR, competition and firm value: using a time lag between CSR and firm value

The benchmark regressions measure CSR and firm value at time t. This is how most of the previous studies model CSR and firm value. Since I use IV-GMM regressions which treat CSR as endogenous, time placement should not change the effect of CSR on firm value. Moreover, CSR scores tend to be sticky and do not change very much every year. However, in order to see if measuring firm value with a time lag changes the effect of competition on the relation between CSR and firm value, I run benchmark regression of CSR on industry adjusted Tobin's Q measured at period t + 1 and CSR and all other control variables measured at period t. The unreported results from IV-GMM regressions show that CSR has a positive and significant effect on firm value only when competition is high and product fluidity is high. In low competition and low product fluidity, CSR does not have any significant effect on firm value. I also run separate regression with two and three year lags between CSR and firm value and find similar results.

7. Conclusion

The relation between CSR and firm value is still an open question as there is neither a unified theory nor unanimous empirical evidence. This study argues that using product market competition and product fluidity may explain scenarios where CSR is a value increasing or value reducing investment. Results from IV-GMM regressions that treat CSR as endogenous find that CSR is a value increasing investment when market competition is high and/or product fluidity is high. When competition is low or product fluidity is low, CSR does not seem to have any significant effect on firm value. Furthermore, the effect of CSR on firm value is driven by CSR strengths as CSR concerns have no effect on firm value. Additionally, I find that community, diversity and environment dimensions are the main contributors to the total effect of CSR on frim value. Overall, the results suggest that external discipline imposed by high competition and high product fluidity makes CSR a value increasing investment.

Appendix A. Definitions of the variables

Net CSR	Total CSR strengths minus total CSR concerns on five dimensions (community, diversity, employees, product and environment)
CSR strengths	Actions that have positive effect on social performance
CSR concerns	Actions that have negative effect on social performance
Adjusted net CSR	Total adjusted CSR strengths minus total adjusted CSR concerns giving equal weight to each of five dimensions
Size	Log of sales
ROA	Net income divided by total assets
Leverage	Ratio of long-term debt to total assets
Tobin's Q	(Market value of equity + book value of debt)/total assets
R&D expenditures	Log (R&D expenditures /net sales)
Advertising expense	Log (advertising expense /total assets)
Capital expenditures	Log (capital expenditures /total assets)
Board size	Total number of directors on the board
Board independence	Number of outside directors /total directors on the board
CEO duality	Dummy variable equals 1 if CEO is also the chair of the board
Religion rank	Ratio of the religious adherents to the total population in the state where the firm headquarters are located
Blue state	Dummy variable equals 1 if the firm headquarters are located in a blue (Democratic) state and 0 otherwise based on 2012 US presidential elections.

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