

The impact of firm age on corporate social responsibility: Does firm age have a different impact on social, environmental and governance performance?

**HeaJeong Han**  
YonSei University  
**Youngchan Kim**  
YonSei University

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## ABSTRACT

Using panel data for 184 US-listed firms from 2010 to 2018, we examine how corporate social responsibility(CSR), CSR adverse events and CSR three pillars (environment, social, governance) affect corporate financial performance(CFP), and investigate the moderating effect of firm age on these relationships. Results show that CSR and environmental performance have positive impact on CFP, but firm age negatively moderate these relationships. Positive association between social performance and CFP is strengthened by firm age. We explain these results based on the context of CSR value embeddedness to firm image and stereotypes. Further test of environmental subcategories (emissions, innovation and resource use) indicates that resource use is positively associated with CFP, while emission reduction is negatively related to CFP. We suggest that older firm to focus more on social aspect CSR and adverse events management, and younger firm to devote more to environment, especially resource use.

Key words:

Firm age

CSR value embeddedness

Social and environmental CSR

Track:

Social Responsibility & Ethics

## 1. Introduction

If Merck, with its 125-year history, discontinues the MECTIZAN<sup>®</sup> (ivermectin) Donation Program (MDP), which has been around for more than 30 years, would it affect the financial performance of the company? Launched in 1987, this program is one of the longest-running social aspect program among three pillars of CSR: social, environmental and governance.

The impact of CSR on the financial performance is a critical factor in determining the investment and sustainability of CSR activities. Friedman insisted that the only social responsibility in business is to use resources and increase profits (Friedman, 1970), on the other hand, Arrow argued that companies should have social responsibility (Arrow, 1973, 1985). In many prior research to explore the relationship between CSR and CFP, some results have shown positive relationships (Luo and Bhattacharya, 2006; Schnietz and Epstein, 2005), while others have indicated negative (Brammer et al., 2006) or insignificant relationships (Moore, 2001; McWilliams and Siegel, 2000). A meta-analysis has indicated a generally positive relationship between CSR and CFP (Peloza, 2006), but another meta-analysis with a total of 167 studies showed that 58% were not significant relationship (Margolis and Elfenbein, 2007). Furthermore, previous studies on the relationship between CFP and the environmental performance which is one pillar of CSR, also showed both positive (King and Lenox, 2001; Russo and Fouts, 1997; Wagner and Schaltegger, 2004) and negative results (Stanwick et al., 1998; Hassel et al., 2005). So inconsistent empirical findings persist for the relationship between corporate environmental performance and CFP (Endrikat et al., 2014).

Based on these different arguments, we assume that the relationship between CSR performance and CFP probably depends on the characteristics of the firm, in particular, the firm's life cycle. Firm's resources and capabilities evolve and change over time in important ways (Helfat and Margaret, 2003). Older firms have more established routines and ability than younger ones (Amburgey et al., 1993; Henderson, 1999) and have better proper form to engage in innovation, proactivity and risk-taking (Anderson et al., 2013), therefore they can be more profitable (Akben-Selcuk, 2016). From this point of view, older firms can engage CSR more effectively in their financial performance.

Nevertheless, we expect firm age to have a negative impact on the relationship between CSR and CFP. Based on the signaling theory, CSR signals firm's unobserved characteristics such as superior resources and capabilities, and sends a positive signal to stakeholders for the evaluation of firm's potential value (Su et al., 2016). However, as more information is available to stakeholders in the market, CSR practices gradually lose their value as a signal for a firm's high capability status (Su et al., 2016). Over time, this CSR value can be embedded in existing firm image and becomes a firm stereotype. In the meantime, stakeholders gradually adapt to the value that comes from CSR. Therefore, we anticipate that firm age attenuates the positive relationship between CSR and CFP. So, should older firms reduce their CSR investments? To answer this question, we

investigate the moderating effects of firm age on the relationships between CFP and CSR's three fundamental components: social, environmental and governance performance. This analysis allows us to determine if the impact of CSR on CFP is different between older and younger firms according to CSR's three pillars. For environmental CSR, firms use renewable energy, water and energy-efficient machinery in their production processes, and some firms only use certified materials (Dangelico et al., 2010). Because firms can attach these values directly to their products and easily convey values to their stakeholders, environmental performance can have a positive impact on CFP in less time. However, this causes stakeholders to quickly adapt to environmental values and lose signaling effects from values faster than those from social values. As MSD's Mectizan Donation Program shows, social aspect CSR requires working with many communities and partners. For the development of the communities, firms should provide the necessary knowledge and skills to communities, and have close ties with them (Ismail, 2009). The skills and core competencies possessed by CSR managers are critical internal factors in determining the success of community development and a variety of roles and specific skills are required (Ismail, 2009). Considering this from a resource-based view, the social aspect of CSR may be more advantageous for older firms as they have more relevant skills, tacit knowledge and experience than younger firms. In addition, since social values are less easily attached to products compared to environmental values, these values are not expected to be easily stereotyped.

Using a dataset of 184 US-listed firms covering the 2010–2018 period, we empirically study the differences in the moderating effects of firm age in CSR and its three pillars: social, environment, and governance. This research contributes to the literature in several important ways. First, we provide empirical evidence linking firm age to the relationships not only between CSR and CFP, but also between the three pillars of CSR and CFP and present a detailed insight for younger and older firms. Secondary, we describe our results in a conceptual framework in which the value of CSR is gradually embedded in corporate image over time and forms firm stereotypes in the perception of stakeholders. During this process, stakeholders are adapted to the CSR value and the influence of CSR is reduced. For example, stakeholder perceptions can change over time from "a company that saves children's lives" to "a warm company". This is the first study to link CSR and its three pillars to the firm life cycle and empirically document its mechanisms. Third, further analysis results indicate that the performance of the three subcategories belonging to the same pillar, the environment, does not have the same effect on CFP, suggesting that future studies on CSR and CFP relationships need to be explored in various subcategories.

## **2. Conceptual model and hypotheses development**

### *2.1 Corporate Social Responsibility and Firm's Performance*

CSR triggers the corporate image building process and strengthens the effect of corporate identity

management on corporate image attractiveness (Lamond et al., 2010). In addition, companies try to create CSR image (Crane, 2016), and stakeholders can recognize this image as an additional value that is distinct from firm's existing value. The moral value of consumers interacts with CSR performance and has influence on brand attitude (Schuler and Cording, 2006), and impacts on the purchase intentions (Schuler and Cording, 2006). On the other hand, CSR adverse event (CSR AE) is expected to negatively affect CFP as it can undermine corporate image and lower product preferences. Therefore, we propose the following hypotheses:

Hypothesis 1a. The better CSR performance, the more positive it is to its financial performance.

Hypothesis 1b. Financial performance of firms with high CSR AE is lower than that of firms with low CSR AE.

Firms continuously analyze energy costs and environmental impacts for the environmental friendliness of the product over the whole life cycle (Dangelico et al., 2010). For example, J&J focuses on sustainable design, material use efficiency, reduction in product packaging, and managing product end-of-life impacts (J&J website). Stakeholders can recognize that firms provide greater value through their commitment to providing green products (Dangelico et al., 2010) and consumers are more willing to purchase from companies that show higher commitment to environmental protection even at slightly higher prices (Rashid et al., 2015). Social CSR such as a healthy and safe workplace, human rights, community, and customer health and safety can also create added value for stakeholders. The ethicality of a firm's behavior is an important consideration during purchasing decisions, and customers are willing to pay higher prices for that firm's products (Creyer et al., 1997). Therefore, we predict that the environmental and social performance to be positively associated with CFP.

Hypothesis 1c. The better environmental CSR performance, the more positive it is to its financial performance.

Hypothesis 1d. The better social aspect CSR performance, the more positive it is to its financial performance.

## *2.2 Firm age, CSR value embeddedness and firm stereotypes*

Consumer expectations for CSR are based on previous experience and are defined by a belief in what is expected from the CSR program (Creyer et al., 1997; Becker-Olsen et al., 2011). Consumers have different expectations for firms regarding CSR activities according to their experiences and the more robust and frequent an experience is, the greater is the intensity of expectations associated with that event (Becker-Olsen et al., 2011). Where the CSR landscape is much more developed and competitive, consumers desire for a variety of CSR programs and activities (Dawkins and Lewis 2003, Becker-Olsen et al., 2011). Thus over time, stakeholder's expectations of CSR for the same firm may change and perceived CSR value is gradually embedded in firm image. Firm image is defined as 'the net result of all experiences, impressions, beliefs, feelings, and knowledge that people have acquired related to a company' (Worcester, 2009). It is 'the aggregate of impression' (Bromley, 1993) or set of stakeholders' perceptions (Holzhauer, 1999 ; Lemmink et al., 2003). A good firm image among

stakeholders can have a positive impact on firm's performance. CSR signals a change in value creation (Visser, 2015), and over time, added value created by CSR is increasingly embedded and integrated into the firm's existing image, and gradually becomes a new firm image and stereotypes. Added value of CSR itself no longer feel special to stakeholders as time passed. Therefore, firm age is expected to weaken the positive association between CSR and CFP (fig.1.).

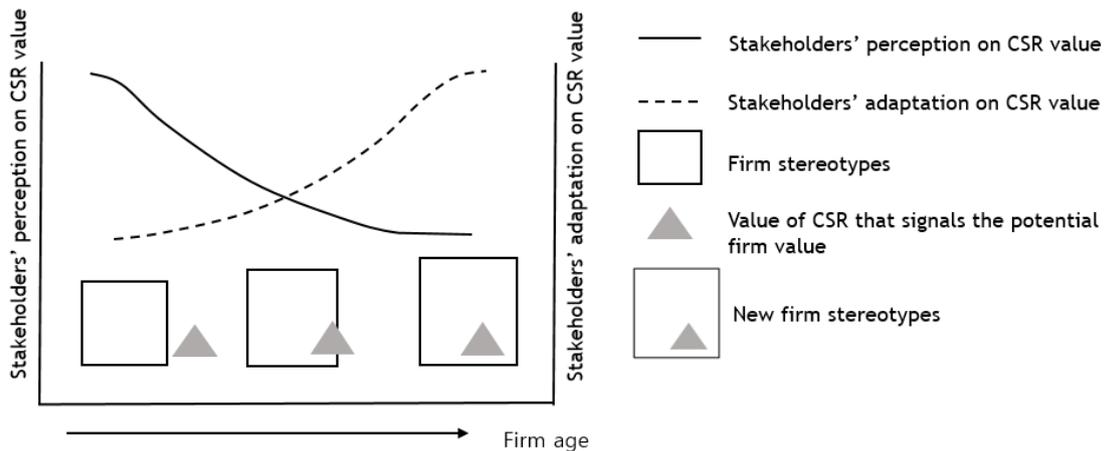


Fig. 1. Stakeholders' perception and adaptation to the value from CSR

Corporate images held by various publics are only in part due to stereotypes (Martineau, 1958; Hill, 1962). Stereotypes and images are not exactly the same meaning (Hill, 1962) and unlike representations of social stereotypes, 'images are patterns or configurations of coherent beliefs about the character, intentions, motives, and emotions' (Alexander et al., 2005). Therefore, images are relatively more flexible and more likely to change than stereotypes, and once stereotyped, they are not easy to change. After the value generated by CSR is stereotyped, the signals of CSR value are expected to be mitigated among stakeholders and not recognized well. In addition, we expect that this process in which the value created by CSR is added to firm image and becomes a solid stereotype will vary depending on the type of CSR. As firms strive to link environmental values to their products (Dangelico et al., 2010), stakeholders are more exposed and easily adaptable to added value of environmental CSR unlike social-related CSR.

Hypothesis 2a. Firm age weakens the positive relationship between CSR and CFP.

Hypothesis 2b. Firm age weakens the positive relationship between environmental-related CSR and CFP.

Hypothesis 2c. Firm age strengthens the positive relationship between social-related CSR and CFP.

### 2.3 Environment subcategories, emission reduction, and resource use

Do subcategories within the same pillar of CSR have the same effect on CFP? We investigate into three environmental subcategories: emission reduction, innovation and resource use. Among them, resource use which is a firm's ability to reduce the use of materials, energy or water, and to find more eco-efficient solutions,

is expected to have a positive relationship with CFP, as the value of resource use can be easily attached to products and delivered to customers. On the other hand, emission reduction is expected to have a negative relationship with CFP. In many countries around the world, emission limits have become more stringent in past decades (Weiss et al., 2011), and like the Euro 5,6,7 emission standards, the EU wants to further tighten emission regulations. In a situation where firms have to comply with strong government regulations, firms' emission reduction is perceived as a corporate obligation, making it difficult for stakeholders to recognize added value. Hence, it is difficult to convey a competitively positive signal to stakeholders. Rather, due to the costs of equipment, technology and materials incurred that have to comply with stringent government regulations, it is expected to have a negative impact on CFP.

Hypothesis 3a. In environmental CSR, the better emission reduction performance, the more negative it is to CFP.

Hypothesis 3b. In environmental CSR, the better resource use performance, the more positive it is to CFP.

### **3. Methodology**

#### *3.1. The performance of CSR, CSR AE event, CSR three pillars and environmental three subcategories*

To test the hypotheses, we used a panel dataset from Thomson Reuters ASSET4 for 184 US-listed firms during the period from 2010 to 2018. This includes performance in CSR, CSR AE, environmental, social, governance and environmental subcategories. ASSET4 data has already been used in prior literature on CSR performance (Ioannou and Serafeim, 2012; Lys et al., 2015; Ioannou et al., 2014; Eccles et al., 2014).

#### *3.2. Corporate financial performance*

In this study, the dependent variable, financial performance, is Tobin's q, which has been used as an indicator of corporate financial performance in many previous studies (Dowell et al., 2000; Bhattacharya et al., 2006; Lioui et al., 2012). It has been used as a proxy for firm value in hundreds of articles published in most finance and economics journals (Bartlett, 2018). We collected firm's total market value and total asset value from Thomson Reuters DataStream and calculated Tobin's q using the following formula. The data was skewed to the right, so it was log-transformed.

Tobin's q = Total Market Value of Firm / Total Asset Value of Firm

#### *3.3. Moderating variables – firm age*

Loderer and Waelchli (2010) defined firm age as the age of a legal entity. Therefore, we defined firm age as the year since the company was officially established. The ages of 184 firms were calculated in year from the date of their establishment. Firms' founding date was collected on their official website.

### 3.4. Control variables: reputation, ROA, capital intensity, intangible assets, number of employees

To control other impacts on financial performance, we control several variables that may affect the financial performance based on prior studies: corporate reputation (Roberts et al., 2002; Yim et al., 2019), ROA (Luo et al., 2006; García-Sánchez, et al., 2019; Aouadi et al., 2018), capital intensity (Capon et al., 1990; Russo et al., 1997; Lin et al., 2015), intangible assets (Gamayuni, 2015) and number of employees (King and Lenox 2002; Luo and Bhattacharya, 2006). Reputation data was collected from Fortune's most admired companies' data file. ROA, and capital intensity, defined as the ratio of total sales to total assets, were obtained from COMPUSTAT. Intangible asset and number of employees was collected from Thomson Reuters DataStream and natural log-transformed due to large values. As capital intensity data was skewed to the right, its natural logarithm value was used.

### 3.5. Analysis methods

The final sample consists of 184 firms' nine-years of observations, including 11 firms with no ESG and ESG controversies score for more than three years due to changes in mergers and acquisitions or separation such as AbbVie. First, we test the correlation between the variables we are analyzing. Table 1 shows the correlation matrix with Pearson's correlation coefficient.

TABLE 1  
Descriptive statistics and correlations.

Variables	log_Tobin's q	CSR	CSR Adverse Event	Firm age	CSR Environment	CSR Social	CSR Governance	Emissions(E)	Innovation(E)	Resource Use(E)	Reputation	ROA	log Capital Intensity	log Intangible Asset	log employees
log_Tobin's q	1.00														
CSR	0.04	1.00													
CSR Adverse Event	-0.08	0.31	1.00												
Firm age	-0.26	0.19	0.08	1.00											
CSR Environment	0.11	0.78	0.31	0.13	1.00										
CSR Social	0.06	0.82	0.31	0.14	0.68	1.00									
CSR Governance	-0.01	0.60	0.11	0.08	0.27	0.38	1.00								
Emissions(E)	0.00	0.73	0.33	0.06	0.79	0.68	0.24	1.00							
Innovation(E)	-0.04	0.33	0.20	0.12	0.64	0.20	0.13	0.20	1.00						
Resource Use(E)	0.09	0.74	0.30	0.05	0.80	0.70	0.22	0.68	0.24	1.00					
Reputation	-0.09	0.49	0.45	0.24	0.46	0.41	0.21	0.43	0.32	0.41	1.00				
ROA	0.65	0.13	-0.03	-0.15	0.17	0.15	0.04	0.10	0.09	0.16	0.02	1.00			
log Capital Intensity	-0.60	0.00	0.10	0.10	-0.09	0.03	-0.08	0.08	-0.05	-0.06	-0.10	-0.42	1.00		
log Intangible Asset	0.01	0.30	0.29	0.07	0.25	0.24	0.09	0.22	0.10	0.24	0.39	-0.07	0.27	1.00	
log employees	0.06	0.43	0.37	0.20	0.42	0.43	0.16	0.30	0.30	0.41	0.68	0.12	-0.28	0.33	1.00
M	0.01	67.75	42.18	75.08	54.13	59.83	59.32	60.58	54.38	65.55	270.40	8.14	0.51	15.18	10.51
SD	1.00	16.06	26.18	51.81	25.30	20.03	20.69	26.67	26.97	26.07	173.85	6.18	1.01	1.75	1.23

Notes: N=1,656. Correlations in italics are not significant. All other correlations are significant at p<.05.

### 3.6. Model

In this study, linear models for panel data (plm) analysis was used to test the hypotheses. By analyzing with a fixed effect model, we eliminated the key source of omitted variable bias, namely, unobservable across-firm differences.

$$Ln\_FirmPerformance_{it} = \beta_1 CSR_{it} + \beta_2 CSR\ AE_{it} + \beta_3 FirmAge_{it} + \beta_4 (CSR_{it} * FirmAge_{it}) + \beta_5 (CSR\ AE_{it} * FirmAge_{it}) + \beta_6 Reputation_{it} + \beta_7 ROA_{it} + \beta_8 ln\_CapitalIntensity_{it} + \beta_9 ln\_IntangibleAsset_{it} + \beta_{10} ln\_Employee_{it} + \alpha_i + u_{it} \quad (\text{Model 2})$$

$$\begin{aligned} \ln\_FirmPerformance_{it} = & \beta_1 CSR\_Environmental_{it} + \beta_2 CSR\_Social_{it} + \beta_3 CSR\_Governance_{it} + \beta_4 Age + \beta_5 (CSR\_Environmental_{it} \\ & *Age_{it}) + \beta_6 (CSR\_Social_{it} * Age_{it}) + \beta_7 (CSR\_Governance_{it} * Age_{it}) + \beta_8 Reputation_{it} + \beta_9 ROA_{it} + \\ & \beta_{10} \ln\_CapitalIntensity_{it} + \beta_{11} \ln\_IntangibleAsset_{it} + \beta_{12} \ln\_Employee_{it} + \alpha_i + u_{it} \end{aligned} \quad (Model\ 4)$$

$$\begin{aligned} \ln\_FirmPerformance_{it} = & \beta_1 Env\_Emission_{it} + \beta_2 Env\_Innovation_{it} + \beta_3 Env\_Resource\ Use_{it} + \beta_4 Reputation_{it} + \beta_5 ROA_{it} + \\ & \beta_6 \ln\_CapitalIntensity_{it} + \beta_7 \ln\_IntangibleAsset_{it} + \beta_8 \ln\_Employee_{it} + \alpha_i + u_{it} \end{aligned} \quad (Model\ 5)$$

To control for potential heteroscedasticity, we included firm and year fixed effects in our model specification.

## 4. Result

The estimated results are summarized in table 2. H1a and H1b predicted that CSR would positively affect financial performance and CSR AE would be negatively associated with financial performance. Model 1 examines this prediction, and the results are significant, supporting H1a ( $\beta = .0061$ ,  $p < .001$ ) and H1b ( $\beta = -.0011$ ,  $p < .05$ ). Model 2 results show the negative moderating effect of firm age on the relationship between CSR and CFP ( $\beta = -.00005$ ,  $p < .05$ ) and support H2a. These findings elucidate that despite the

Table 2  
PLM estimation results.

	Model 1		Model 2		Model 3		Model 4	
	log_Tobin'q		log_Tobin'q		log_Tobin'q		log_Tobin'q	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
CSR	.0061***	.0012	.0031	.0020				
CSR adverse event	-.0011*	.0004	-.0003	.0007				
Firm age			.0521***	.0042			.0465***	.0040
CSR_Environment					.0019 <sup>†</sup>	.0009	.0059***	.0015
CSR_Social					.0021 <sup>†</sup>	.0011	-.0068***	.0019
CSR_Governance					-.0009	.0007	-.0014	.0013
CSR x Firm age			-.00005*	.00002				
CSR Adverse event x Firm age			-.000005	.00001				
CSR_Environment x Firm age							-.00007***	.0000
CSR_Social x Firm age							.00007***	.0000
CSR_Governance x Firm age							-.000004	.0000
Reputation	-.0005**	.0002	-.0007***	.0002	-.0006***	.0002	-.0009***	.0002
ROA	.0235***	.0022	.0210***	.0021	.0250***	.0022	.0220***	.0021
log Capital Intensity	-.4167***	.0647	-.4829***	.0610	-.3748***	.0668	-.4459***	.0626
log Intangible assets	.0229	.0205	-.0314	.0197	.0142	.0207	-.0347 <sup>†</sup>	.0198
log Employees	-.0183	.0464	-.0626	.0441	-.0074	.0481	-.0327	.0456
Number of observations	1404		1399		1319		1314	
Unbalanced panel	176		176		169		169	
R <sup>2</sup>	.18		.28		.17		.29	
Adj. R <sup>2</sup>	.06		.17		.05		.18	
d.f.	1221		1213		1142		1133	
F-statistic	38.872***		48.0383***		30.8503***		38.561***	
Hausman test	$\chi^2 = 82.027$		$\chi^2 = 183.67$		$\chi^2 = 340.29$		$\chi^2 = 135.4$	
	p-value: < .0000***		p-value: < .0000***		p-value: < .0000***		p-value: < .0000***	

\*p<.05, \*\*p<.01, \*\*\*p<.001. Notes N=1,656. We estimate all models with the fixed effect panel linear model.

positive association between CSR and CFP, this association is weakened in older firms. H1c and H1d predicted that environmental CSR and social CSR would have positively affect CFP. Model 3 results indicate significant result and support H1c ( $\beta = .0019$ ,  $p < .05$ ) and H1d ( $\beta = .0021$ ,  $p < .05$ ). Results does not show the governance impact on CFP. Model 4 results show the moderating effects of firm age between environmental performance and CFP and between social performance and CFP. Firm age weakens the positive relationship between environment and CFP ( $\beta = -.00007$ ,  $p < .001$ ). On the other hand, firm age

strengthens the positive relationship between social and CFP ( $\beta = .00007, p < .001$ ). These results support H2b and H2c. Our results indicate that for older firms, focusing on social-related CSR would be more advantageous and for younger firms, concentrating on environmental-related CSR would be more profitable. We further analyzed with environmental subcategories, and model 5 results show that resource use has a positive effect on CFP ( $\beta = .002, p < .05$ ), while emission reduction negatively affects CFP ( $\beta = -.0028, p < .01$ ) and support H3a and H3b (table 3).

## 5. General discussion

Our study suggests some important theoretical implications. First, we found that firm age is critical in the relationship between CSR and CFP. In particular, by demonstrating that the impact of firm age is different depending on CSR elements, we suggest that various corporate characteristics should be considered in CSR-CFP relationship research. Second, we propose a conceptual framework for why CSR's impact on CFP decreases as firm ages through new values generated from CSR, stakeholder expectations and adaptation about this value, value embeddedness into firm image and firm stereotypes. We also provide some managerial implications. First, we recommend that managers responsible for CSR should consider their firm life cycle in managing CSR. Second, as firms get older, they need to establish CSR strategies by considering the characteristics of CSR, such as social or environmental aspects for leading positive financial performance. It should also be considered that even within one pillar, for example the environment, the impact on CFP is different according to subcategories such as emission and resource use. Third, it may be more efficient for older firms to manage more CSR AEs, and for younger firms to invest heavily in CSR. And it may be more beneficial for older firms to invest in the social pillar, and for younger firms in the environment pillar.

Walmart's report mentions its commitment to meeting customer expectations for CSR as a top priority (2018 Walmart Global Responsibility Report). The same is true for other older firms such as Merck, Johnson and Johnson, and ADM. They implement CSR as one of their top priority. According to our results, these activities may not have a direct or large impact on their financial performance compare to younger firms. However, as Merck says "Supporting society, people and communities around the world is fundamental to our long-term success", beyond thinking of CSR as generating profit, devoting to meeting stakeholder expectations through CSR can be a driving force for corporate sustainability.

Table 2  
PLM estimation results.

	Model 5	
	log_Tobin'q	
	Coefficient	SE
Env_Emission	-.0028**	.0010
Env_Innovation	.0003	.0008
Env_Resource Use	.0020*	.0010
Reputation	-.0002	.0002
ROA	.0245***	.0026
log Capital Intensity	-.2859***	.0781
log Intangible assets	-.0376	.0270
log Employees	.0506	.0634
Number of observations		864
Unbalanced panel		123
R <sup>2</sup>		.18
Adj. R <sup>2</sup>		.03
d.f.		733
F-statistic		20.1015***
Hausman test		$\chi^2 = 81.177$
		p-value: < .0000***

\*p<.05, \*\*p<.01, \*\*\*p<.001. Notes N=1,656 .We estimate all models with the fixed effect panel linear model.

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