Greenwashing and product market competition

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Abstract

This study examines the relationship between corporate greenwashing and product market competition (PMC). Using an unbalanced panel of 324 US firms over the 2005-2015 period, we find that the negative impact of PMC on greenwashing is conditional on the level of environmental costs. Our results suggest that PMC is an effective disciplinary mechanism for achieving economic efficiency –in the case of firms featuring a high level of environmental costs– through an increase in the disclosure of reliable and material information.

JEL classification: M14, G32, L10

Keywords: Greenwashing, Product market competition, Environmental cost

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1. Introduction

Research on corporate social responsibility (CSR, henceforth) shows that CSR activities can have beneficial impacts on firm reputation (Martínez-Ferrero et al., 2016), market share (Lev et al., 2010), the cost of capital (El Ghoul et al., 2011), the value of cash holdings (Arouri and Pijourlet, 2017), and firm value (Ferrell et al., 2016). Recent trends also point toward an increase in demand for green products[1] and assets issued by responsible firms[2]. Because of these expected benefits, the proportion of firms issuing social and environmental reporting has been considerably growing in the past few years[3]. This increase in CSR awareness raises the risk that firms may choose to engage in strategic disclosure and communication in order to appear "greener" than they really are. Such practices are usually referred to as greenwashing. Specifically, a firm is said to greenwash when it discloses positive environmental actions while concealing negative ones to create a misleadingly positive impression of overall environmental performance (Lyon and Maxwell, 2011). Greenwashing may produce negative effects on consumers and investors' confidence in CSR activities and green products. It is therefore crucial to understand the drivers of such behavior.

Despite the potential negative impact of greenwashing, there is only a handful of studies investigating it (Du, 2015; Kim and Lyon, 2015; Laufer, 2003; Marquis et al., 2016). While existing empirical works have mainly focused on firm-level or institutional determinants (Kim and Lyon, 2015; Marquis et al., 2016), no study has addressed the potential impact of product market competition (PMC, henceforth) intensity on greenwashing behavior. The potential link between greenwashing and PMC is theoretically ambiguous. On the one hand, high

[1] According to the 2015 Nielsen Global Survey of Corporate Social Responsibility and Sustainability, 66% of global consumers said they were willing to pay more for sustainable brands (up 55% From 2014) and 73% of global millennials were willing to pay extra for sustainable offerings (up From 50% in 2014).

[2] According to the US SIF Foundation's 2018 Report on Sustainable and Responsible Investing Trends in the United States, sustainable, responsible and impact investing (SRI) assets have expanded to $12 trillion in the United States, up 38% from $8.7 trillion in 2016.

[3] For instance, according to the Governance & Accountability Institute 2019 sustainability report, the number of S&P 500 firms that issue sustainability reporting has risen from 20% to 86% between 2011 and 2018. Source: www.ga-institute.com

competitive pressures could lead to the spread of censured behaviors such as greenwashing (Shleifer, 2004). Indeed, if greenwashing by competitors improves their image, reduces their cost of capital and increases their revenues by attracting responsible consumers and investors, the resulting disadvantage for ethical (non-greenwashing) firms will lead them to change their behavior, resulting in a spread of greenwashing. On the other hand, PMC could act as a disciplinary mechanism, reducing the propensity of managers to engage in greenwashing. That will be the case if the perceived costs of greenwashing exposure are superior to its potential benefits. The higher the proportion of customers and investors willing to pay for ethical behavior through private choice (e.g., by boycotting greenwashing firms' products and assets), the higher these costs will be. Empirical research seems to support this view. Du (2015) shows that firms experience negative market reactions around the exposure of greenwashing. Arguably, this financial loss will be all the more pronounced if the firm operates in a highly competitive landscape, because customers will have more alternatives to replace greenwashing firms' products by competitors'. Furthermore, the disciplining effect of PMC should be more pronounced for polluting firms as these are the ones that should be more inclined to engage in greenwashing in the first place.

To test which of these two opposing views prevails, we empirically examine how firms' greenwashing practices are associated with PMC intensity. More precisely, we study an unbalanced panel of 324 US firms over the 2005-2015 period. We find that the joint effect of environmental costs and PMC significantly impacts the degree to which firms engage in greenwashing. Specifically, we show that the negative impact of PMC on greenwashing is more pronounced for firms featuring a high level of environmental costs.

Although a few authors have investigated the link between PMC and CSR (Flammer, 2015; Han et al., 2018; Ryou et al., 2019), no study has –to our knowledge– addressed the association between PMC and greenwashing. Yet, greenwashing and CSR are two related but different concepts. First, CSR is a wider construct encompassing environmental, social and governance concerns while greenwashing deals specifically with environmental considerations. Second, greenwashing relates to potential inconsistencies between environmental disclosures and actual environmental performance. We therefore contribute to the literature by focusing specifically on selective environmental disclosures, i.e., on the gap that may ex-

ist between environmental communication and actual environmental performance. In doing so, we attempt to better understand the drivers of corporate environmental communication strategies and of potentially misleading disclosures.

This article is organized as follows. Section 2 presents the research design including data presentation, sample, and methodology. Section 3 presents and discusses the empirical results. Section 4 concludes.

2. Research design

2.1. Greenwashing

We obtain greenwashing data from Trucost. We follow Marquis et al. (2016) and measure greenwashing (GW)as the difference between two ratios that Trucost developed to assess companies' environmental transparency; that is, absolute disclosure ratio minus weighted disclosure ratio. This measure seeks to assess the extent to which symbolic transparency (measured by *absolute disclosure ratio*) exceeds substantive transparency (measured by *weighted disclosure ratio*), i.e., it proxies for the potential tendency of companies to create a misleading impression of transparency and accountability by disclosing relatively benign environmental metrics rather than those more representative of their overall environmental harm. The *absolute disclosure ratio* is the proportion of relevant environmental indicators for which a firm discloses quantitative figures. The denominator of this ratio is the number of environmental indicators relevant to a particular firm depending on the industries in which it operates, while the numerator is the number of these indicators that the firm discloses. *The weighted disclosure ratio* incorporates to each environmental indicator the environmental impact associated with it. Stated differently, the *absolute disclosure ratio* reflects how many of the relevant environmental indicators the company disclosed regardless of their relative importance while the *weighted disclosure ratio* shows how much of the most important information was disclosed[4]. When a firm's *absolute disclosure ratio* exceeds its *weighted disclosure ra-*

[4]As an example, suppose firm A and B are identical but firm A discloses only the 5 least damaging indicators out of 10 while firm B discloses only the 5 most damaging out of 10: they will have the same *absolute disclosure ratio* as they have disclosed the same amount of information, but firm B's *weighted disclosure ratio* will be higher than that of firm A, because firm B has disclosed more important information.

tio, the firm engages in greenwashing by disclosing its less harmful indicators and not fully disclosing its most harmful ones.

2.2. Product market competition

We retrieve PMC proxies from Hoberg et al. (2014) and Hoberg and Phillips (2016)[5]. Specifically, we use the TNIC Herfindahl-Hirschman Index, TNIC Similarity, and Fluidity measures. The TNIC Herfindahl-Hircshman Index (TNIC HHI) is calculated as the sum of the squared market shares of all firms operating in the same industry, using the time varying Text-based Network Industry Classification (TNIC) developed by Hoberg and Phillips (2016). A higher TNIC HHI denotes a higher level of industry concentration, and thus a lower degree of PMC. TNIC SIMILARITY is the sum of yearly similarity scores between the focal firm and all possible competitors in the same TNIC. Under this classification system, each firm has its own set of distinct competitors. A greater product similarity indicates a higher degree of PMC. FLUIDITY is based on product descriptions found in firms' 10–K filings and captures the degree to which a firm's products are sensitive to the evolution of rivals' products. More specifically, it is defined as the similarity between a firm's vocabulary and the change in overall use of vocabulary by rivals in a given industry. A greater similarity in the business descriptions between rivals implies that a firm faces higher competitive threats, and thus a higher intensity of PMC.

2.3. Environmental costs

We employ environmental cost data from Trucost to capture firms' environmental damages ($DAMAGE$). Trucost provides dollar values of firms' environmental damages. They use an input–output model that assesses firms' environmental impact across operations, supply chains, and investment portfolios to compute a firm's environmental costs. Trucost's model estimates the firm's total emissions and then multiplies these quantities by their respective environmental damage cost factors derived from prior environmental economics literature (Trucost, 2014). A firm's environmental damages are based on six areas of direct and indirect emissions: greenhouse gases (GHGs), water, waste, land and water pollutants, air

[5]We download the data from https://hobergphillips.tuck.dartmouth.edu/.

Table 1: Sample description

Year	N	Industry	N
2005	97	Mining	133
2006	105	Construction	40
2007	123	Manufacturing	548
2008	154	Transportation, Communications, Electric, Gas and Sanitary service	384
2009	179	Wholesale trade	41
2010	201	Retail trade	108
2011	216	Finance, Insurance and Real Estate	431
2012	219	Services	339
2013	218		
2014	241		
2015	271		
Total	2,024	Total	2,024

This table presents the sample distribution by year and industry.

pollutants, and natural resource use. We scale environmental damages by total assets as in El Ghoul et al. (2018).

2.4. Sample

We merge greenwashing data from Trucost with PMC data from Hoberg et al. (2014) and Hoberg and Phillips (2016) and financial data from Datastream. The number of US firms featured in both databases is 393, resulting in an initial sample of 2,848 firm-year observations for the 2005-2015 period. The non-availability of necessary control variables for some firms reduces our sample to a final size of 324 US firms over the 2005-2015 period, yielding an unbalanced panel of 2,024 firm-year observations. Table 1 presents a detailed distribution of our sample observations across years and industries.

2.5. Model

To empirically investigate the relationship between PMC and greenwashing and assess whether this relationship is shaped by environmental costs, we estimate the following model:

$$GW_{i,t} = \beta_0 + \beta_1 PMC + \beta_2 (PMC \times DAMAGE) + \beta_3 DAMAGE + \beta_4 X_{i,t} + T_t + \epsilon \quad (1)$$

$X_{i,t}$ is a set of control variables that could affect greenwashing. Following Marquis et al. (2016), these variables include SIZE (natural logarithm of net sales), ROA (return on assets), CAPITAL INTENSITY (Net property, plant, and equipment divided by total assets),

FOREIGN SALES (percentage of sales to foreign countries) and REPUTATION (binary variable taking the value of one if a firm is featured in Fortune's "100 Best Companies to Work For in America" ranking in a given year and zero otherwise). In addition, the impact of PMC on firms also depends on their governance characteristics and the severity of financial constraints they face (Boubaker et al., 2018; Sassi et al., 2019). We therefore add GOVERNANCE (Thomson Reuters Governance Score) and FINANCIAL CONSTRAINTS (binary variable taking the value of one for dividend-paying firms and zero otherwise) to our model[6]. We also include year and industry fixed effects (T_t) and cluster errors at the firm level.

3. Results

We report descriptive statistics in Table 2. The average firm's net sales amount to \$4.8 billion ($= e^{15.39}$). Average ROA and capital intensity are 5.9% and 28.0%, respectively. Median, minimum and maximum values of our three PMC measures suggest significant differences in PMC intensity among firms and industries. The rest of the descriptive statistics are shown in Table 2.

Table 3 shows that correlation coefficients among variables are relatively weak, indicating that multicollinearity is not an issue. Pairwise correlations between PMC proxies and greenwashing are quite low while that between greenwashing and environmental costs is relatively high and significantly negative (-0.25).

Table 4 shows the estimates of the coefficients in Eq. (1) and their robust standard errors (in parentheses). Columns 1 to 3 feature models excluding the interaction term with environmental damages. The direct impact of PMC on greenwashing does not appear to be significant, regardless of the PMC measure used. Columns 4 to 6 report regression results for our model including the interaction term. Again, the direct relationship between PMC and

[6]Including various relevant control variables as we do reduces engogeneity concerns. However, we cannot completely rule out the possibility of ommitted variables issues. A quasi-natural experiment using shocks to competition intensity (e.g., tariff reductions) would help alleviate this endogeneity concern. However, because of the limited number of tariff reductions after 2005 (the year in which Trucost data become available), we cannot use this approach. We acknowledge this limitation.

Table 2: Descriptive statistics

Variable	N	Mean	S.D.	Min	Median	Max
GW	2,024	-9.89	26.36	-88.00	0.00	30.00
TNIC_HHI	2,024	17.00	16.90	2.36	12.42	72.85
TNIC_SIMILARITY	2,024	5.29	8.42	1.03	2.57	40.14
FLUIDITY	2,024	7.78	3.64	2.32	7.15	17.09
DAMAGE	2,024	5.92	18.22	0.02	1.50	45.81
SIZE	2,024	15.39	1.43	10.98	15.29	18.35
ROA	2,024	5.92	8.42	-28.11	5.53	25.15
CAPITAL INTENSITY	2,024	28.00	28.00	1.00	14.05	90.90
FOREIGN SALES	2,024	26.85	28.92	0.00	18.43	46.73
GOVERNANCE	2,024	48.24	24.62	27.42	48.54	98.49
FINANCIAL CONSTRAINTS	2,024	0.62	0.48	0.00	1.00	1.00
REPUTATION	2,024	0.04	0.19	0.00	0.00	1.00

This table reports descriptive statistics for our sample variables.

Table 3: Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) GW	1											
(2) TNIC_HHI	-0.03	1										
(3) TNIC_SIMILARITY	**0.05**	**-0.27**	1									
(4) FLUIDITY	-0.01	**-0.29**	**0.38**	1								
(5) DAMAGE	**-0.25**	**0.08**	**-0.09**	**-0.08**	1							
(6) SIZE	**-0.22**	**-0.07**	**-0.06**	-0.01	**0.18**	1						
(7) ROA	-0.03	**0.07**	**-0.18**	**-0.17**	0.03	**0.07**	1					
(8) CAPITAL INTENSITY	**-0.23**	**-0.17**	**-0.06**	**0.04**	**0.12**	**-0.09**	**-0.09**	1				
(9) FOREIGN SALES	**-0.14**	**0.26**	**-0.19**	**-0.21**	**0.10**	-0.02	**0.11**	**-0.21**	1			
(10) GOVERNANCE	**-0.27**	**-0.06**	**-0.10**	0.01	**0.21**	**0.36**	0.03	**0.11**	**0.09**	1		
(11) FINANCIAL CONSTRAINTS	**-0.19**	**-0.11**	0.04	**-0.10**	**0.11**	**0.30**	0.02	**0.15**	**-0.07**	**0.27**	1	
(12) REPUTATION	-0.01	0.04	**0.10**	0.03	-0.02	**0.14**	-0.02	**-0.06**	0.04	**0.06**	0.00	1

This table reports correlations between variables. Bold denotes significance at the 5% level or lower.

greenwashing does not appear to be very robust: The TNIC HHI appears to be negatively correlated with greenwashing but the other measures of PMC (TNIC SIMILARITY and FLUIDITY) show no statistically significant link. More interestingly, the interaction term between PMC and environmental damage is always statistically significant. Specifically, the coefficient on (TNIC_HHI $\times$ DAMAGE) is positive (significant at the 1% level) while the coefficients on (TNIC_SIMILARITY $\times$ DAMAGE) and (FLUIDITY $\times$ DAMAGE) are negative (significant at the 1% level). These coefficient signs are consistent as TNIC HHI is negatively associated with PMC (a higher HHI implies less competition) while similarity and fluidity are positively associated with PMC. Our results show that the negative impact of PMC on greenwashing is conditional on the level of environmental costs.

In other words, our findings suggest that when firms' environmental costs are high, PMC reduces greenwashing practices. It seems that the managers of more polluting firms do more greenwashing in less-competitive industries where the disciplinary effect of PMC is weaker and where the incentives for managers to pursue private benefits through greenwashing are probably stronger. Intense competition between firms featuring a high level of environmental costs could lead to a reduction in information asymmetry and opportunistic behavior as those firms are led to publish additional verifiable information about their environmental and CSR practices (Giroud and Mueller, 2011) and are therefore less likely to engage in greenwashing. Our results suggest that PMC is an effective disciplinary mechanism for achieving economic efficiency –in the case of firms featuring a high level of environmental costs– through the disclosure of reliable and material information (Shleifer and Vishny, 1997).

To better understand the mechanism underlying our evidence, we conduct further analysis to determine whether the decline in greenwashing comes from weighted disclosure increasing more than absolute disclosure or by weighted disclosure declining less than absolute disclosure (recall that greenwashing is calculated as the difference between these two ratios in order to measure the extent to which firms disclose relatively benign environmental metrics rather than those more representative of their overall environmental harm). Specifically, we estimate two separate regressions using the absolute disclosure ratio and the weighted disclosure ratio as dependent variables. Results are reported in Table 5 and show that the PMC-led decrease in greenwashing for polluting firms comes from a greater increase in substantive disclosure

Table 4: Greenwashing, environmental damage and product market competition

	Greenwashing					
	(1)	(2)	(3)	(4)	(5)	(6)
TNIC_HHI	-0.051			-0.173***		
	(0.06)			(0.07)		
TNIC_SIMILARITY		-0.140			-0.003	
		(0.15)			(0.11)	
FLUIDITY			-0.348			0.216
			(0.33)			(0.33)
TNIC_HHI × ENV_DAMAGE				0.015***		
				(0.00)		
TNIC_SIMILARITY × ENV_DAMAGE					-0.213***	
					(0.05)	
FLUIDITY × ENV_DAMAGE						-0.121***
						(0.03)
DAMAGE	-0.109	-0.115	-0.112	-0.613**	0.197	0.554**
	(0.15)	(0.15)	(0.14)	(0.30)	(0.13)	(0.22)
SIZE	-2.704***	-2.665***	-2.590***	-2.362***	-2.478***	-2.462***
	(0.89)	(0.88)	(0.87)	(0.85)	(0.86)	(0.84)
ROA	0.126*	0.102	0.098	0.131*	0.093	0.098
	(0.08)	(0.08)	(0.08)	(0.07)	(0.08)	(0.07)
CAPITAL INTENSITY	-19.252***	-19.250	-18.543	-0.176***	-0.155***	-0.160***
	(4.20)	(4.18)	(4.07)	(4.15)	(3.99)	(3.80)
FOREIGN SALES	-0.024	-0.039	-0.041	-0.031	-0.077*	-0.042
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
GOVERNANCE	-0.126***	-0.126***	-0.124***	-0.125***	-0.099***	-0.106***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
FINANCIAL CONSTRAINTS	-6.678***	-6.678***	-7.137***	-6.972***	-6.786***	-7.119***
	(2.48)	(2.45)	(2.42)	(2.39)	(2.34)	(2.30)
REPUTATION	1.842	2.559	1.588	0.533	2.199	0.526
	(6.29)	(6.41)	(6.28)	(6.57)	(6.98)	(6.55)
Constant	50.141***	50.248***	51.597***	48.830***	49.320***	45.390***
	(14.53)	(14.21)	(14.34)	(14.04)	(14.02)	(13.55)
Industry control	yes	yes	yes	yes	yes	yes
Year control	yes	yes	yes	yes	yes	yes
Observations	2,024	2,024	2,002	2,024	2,024	2,002
R^2	0.298	0.299	0.299	0.322	0.332	0.327

The dependent variable is Trucost's greenwashing measure. DAMAGE is Trucost's estimate of firms' environmental cost (in USD) scaled by total assets. Size is the natural logarithm of net sales. ROA is return on assets. CAPITAL_INTENSITY is the ratio of net property, plant, and equipment to total assets. FOREIGN SALES is percentage of sales to foreign countries. GOVERNANCE is Thomson Reuters Governance score. FINANCIAL CONSTRAINTS is a binary variable taking the value of one for dividend-paying firms and zero otherwise. REPUTATION is a binary variable taking the value of one if a firm is featured in Fortune's "100 Best Companies to Work For in America" ranking in a given year and zero otherwise. Errors are clustered at the firm level. *, **, and *** denote statistical significance at the 10%, 5%, and 1%, respectively.

(weighted disclosure ratio) than in symbolic disclosure (absolute disclosure ratio).

4. Concluding remarks

In this paper, we study the impact of product market competition (PMC) on greenwashing behaviors. Using Trucost data and PMC measures developed by Hoberg et al. (2014) and Hoberg and Phillips (2016), we find that the joint effect of environmental costs and PMC significantly impacts the degree to which firms engage in greenwashing. Specifically, we show that the negative impact of PMC on greenwashing is conditional on the level of environmental costs. Additional analysis supports the idea that more environmentally damaging firms exhibit more substantive disclosure when faced with higher PMC. Our results suggest that PMC is an effective disciplinary mechanism for achieving economic efficiency –in the case of firms featuring a high level of environmental costs– through an increase in the disclosure of reliable and material information.

Our study provides avenues for further research. Many research works on the impact of PMC now use a difference-in-difference approach to address endogeneity concerns, using import tariff reductions as exogenous events (Boubaker et al., 2018; Flammer, 2015; Ryou et al., 2019; Sassi et al., 2019). Such an approach is not possible in our case as there is too little overlap between firms belonging to industries having experienced import tariff reductions after 2005 (the year in which Trucost's greenwashing data start). It would therefore be interesting to develop new measures of greenwashing so as to expand the analysis to a broader sample and enjoy more leeway in terms of econometric methodologies.

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Table 5: Absolute disclosure, weighted disclosure, environmental damage and product market competition

	Absolute disclosure			Weighted disclosure		
	(1)	(2)	(3)	(4)	(5)	(6)
TNIC_HHI	0.037			0.201**		
	(0.07)			(0.10)		
TNIC_SIMILARITY		-0.143			-0.139	
		(0.10)			(0.14)	
FLUIDITY			-0.270			-0.486
			(0.37)			(0.45)
TNIC_HHI × ENV_DAMAGE	-0.004			-0.020***		
	(0.00)			(0.01)		
TNIC_SIMILARITY × ENV_DAMAGE		0.028			0.240***	
		(0.05)			(0.08)	
FLUIDITY × ENV_DAMAGE			0.013			0.134***
			(0.02)			(0.03)
DAMAGE	0.0326	-0.159**	-0.189	0.646*	-0.356**	-0.743***
	(0.11)	(0.08)	(0.12)	(0.34)	(0.17)	(0.24)
SIZE	5.950***	6.006***	6.069***	8.312***	8.485***	8.531***
	(1.03)	(1.03)	(1.02)	(1.16)	(1.20)	(1.18)
ROA	0.010	-0.005	0.001	-0.121	-0.098	-0.096
	(0.09)	(0.09)	(0.09)	(0.12)	(0.12)	(0.12)
CAPITAL INTENSITY	8.077*	7.704	8.040*	25.680***	23.210***	23.990***
	(4.82)	(4.75)	(4.84)	(6.43)	(6.23)	(6.30)
FOREIGN SALES	0.000	-0.003	-0.003	0.032	0.074	0.039
	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)
GOVERNANCE	0.195***	0.189***	0.192***	0.319***	0.288***	0.298***
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.06)
FINANCIAL CONSTRAINTS	4.162	4.082	3.817	11.130***	10.870***	10.940***
	(2.84)	(2.83)	(2.96)	(3.52)	(3.50)	(3.56)
REPUTATION	8.252	8.453	7.974	7.719	6.253	7.448
	(8.46)	(8.50)	(8.52)	(10.28)	(10.45)	(10.37)
Constant	-108.000***	-106.600***	-106.000***	-156.800***	-156.000***	-151.400***
	(15.66)	(15.89)	(16.96)	(17.69)	(18.62)	(18.69)
Industry control	yes	yes	yes	yes	yes	yes
Year control	yes	yes	yes	yes	yes	yes
Observations	2,024	2,024	2,002	2,024	2,024	2,002
R^2	0.277	0.277	0.275	0.440	0.441	0.436

The dependent variable is Trucost's absolute disclosure measure in columns 1 to 3 and weighted disclosure measure in columns 4 to 6. DAMAGE is Trucost's estimate of firms' environmental cost (in USD) scaled by total assets. Size is the natural logrithm of net sales. ROA is return on assets. CAPITAL_INTENSITY is the ratio of net property, plant, and equipment to total assets. FOREIGN SALES is percentage of sales to foreign countries. GOVERNANCE is Thomson Reuters Governance score. FINANCIAL CONSTRAINTS is a binary variable taking the value of one for dividend-paying firms and zero otherwise. REPUTATION is a binary variable taking the value of one if a firm is featured in Fortune's "100 Best Companies to Work For in America" ranking in a given year and zero otherwise. Errors are clustered at the firm level. *, **, and *** denote statistical significance at the 10%, 5%, and 1%, respectively.

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