

Strategic management during the financial crisis: How firms adjust their strategic investments in response to credit market disruptions

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[Correction added on 24 July 2021, after first online publication: The copyright line was changed.]

Abstract

Research summary: This study investigates how companies adjusted their investments in key strategic resources—that is, their workforce, capital expenditures, R&D, and CSR—in response to the sharp increase in the cost of credit (the “credit crunch”) during the financial crisis of 2007–2009. We compare companies whose long-term debt matured shortly before versus after the credit crunch to obtain (quasi-)random variation in the extent to which companies were hit by the higher borrowing costs. We find that companies that were adversely affected followed a “two-pronged” approach of curtailing their workforce and capital expenditures, while maintaining their investments in R&D and CSR. We further document that firms that followed this two-pronged approach performed better post-crisis.

Managerial summary: We study how companies adjusted their key strategic investments during the financial crisis of 2007–2009. As financial markets collapsed—and the cost of financing skyrocketed—managers had to rethink their strategic investments. We find that, on average, managers pursued a two-pronged approach of (i) “saving their way out of the

crisis” by curtailing the company’s workforce and capital expenditures and (ii) “investing their way out of the crisis” by maintaining the company’s investments in R&D and CSR. Moreover, we find that firms that followed this two-pronged approach performed better in the post-crisis years. Overall, these findings suggest that investments in innovation and stakeholder relationships are instrumental in sustaining competitiveness during and beyond times of crisis.

KEY WORDS

capital expenditures, corporate social responsibility, employment, financial crisis, financial performance, innovation

1 | INTRODUCTION

The financial crisis of 2007–2009, which originated from the surge in defaults on subprime mortgages, disrupted the U.S. financial sector. It led to the liquidation of Bear Stearns, the bankruptcy of Lehman Brothers, the failure of several regional banks, and the failure of Washington Mutual—the largest bank failure in U.S. history. The collapse of the banking sector led to a credit crisis of historical dimension (known as the “credit crunch”), and an unprecedented increase in the cost of debt financing for companies (e.g., Duchin, Ozbas, & Sensoy, 2010).

As the cost of debt skyrocketed, companies faced higher financing constraints and were less able to finance their projects. The effect of the credit crunch was further amplified by the collapse of the economy—the so-called “Great Recession”—that fundamentally disrupted all aspects of the business environment.¹ The finance literature (e.g., Almeida, Campello, Larangeira, & Weisbenner, 2011; Campello, Graham, & Harvey, 2010; Duchin et al., 2010; Kahle & Stulz, 2013) shows that companies responded to the credit crunch by curtailing their investment in physical capital (i.e., their capital expenditures [CAPEX]).^{2,3}

Besides physical capital, the management literature has identified the firm’s workforce, its innovative capability, and stakeholder relationships as key strategic resources that enable firms

¹The economic crisis of 2007–2009 has been named the “Great Recession” because it was the worst postwar contraction on record. According to the U.S. Department of Labor, the U.S. gross domestic product (GDP) contracted by approximately 5.1% between December 2007 and June 2009. About 8.7 million jobs were lost, while the unemployment rate climbed from 5.0% in December 2007 to 9.5% by June 2009, and peaked at 10.0% by October of the same year. Ben Bernanke, the former head of the Federal Reserve, referred to the financial crisis as being “the worst financial crisis in global history, including the Great Depression” (Wall Street Journal, 2014).

²The finance literature further highlights the credit supply channel—linking how the collapse of the financial sector led to a contraction in lending (e.g., Ivashina & Scharfstein, 2010; Puri, Rocholl, & Steffen, 2011; Santos, 2011)—as an important mechanism explaining the increase in borrowing cost and ultimately the reduction in physical investment.

³Physical investment has a long tradition in the finance literature. In particular, numerous articles examines how financing constraints affect physical investment (e.g., Fazzari, Hubbard, & Petersen, 1988; Hoshi, Kashyap, & Scharfstein, 1991; Kaplan & Zingales, 1997). For surveys of this literature, see Stein (2003) and Maksimovic and Phillips (2013).

to create long-term value (Barney, 1991). Accordingly, from the perspective of strategic management, an important question is how companies adjusted their investments in *all* of their strategic resources—that is, not only their physical capital, but also their workforce, innovative capability, and stakeholder relationships—to sustain their competitiveness when the cost of debt skyrocketed during the crisis. Admittedly, the extreme nature of this event may have compelled companies to rethink and reshape their strategic investments to ensure survival and sustain their competitiveness.

Despite the severity of this event, we know little about its impact on firm-level decision-making and, in particular, on how firms adjusted their resource base in response. While there is a large literature in management that studies organizational decline and corporate turnaround (for a review, see Trahms, Ndofor, & Sirmon, 2013), this literature focuses on very different sources of organizational decline (e.g., business cycle fluctuations, technology shocks, and environmental jolts). Yet, credit crises of this magnitude—and, more broadly, system-level crises such as the Great Depression of 1929, the Great Recession of 2007–2009, and the current COVID-19 crisis—are fundamentally different as they bring about the collapse of the financial sector and impair firms' ability to undertake important investments to sustain their competitiveness.

In this paper, we examine how companies adjusted their resource base in response to the dramatic rise in the cost of debt during the financial crisis, that is, at the time of the biggest system-wide collapse since the Great Depression. Given the inherent complexity of this phenomenon, developing tightly argued hypotheses would be ambiguous at best. Hence, we follow Hambrick (2007) and Helfat's (2007) recommendation to adopt a fact-based approach, focusing our study on documenting the impact of this phenomenon on firm-level decision-making in the hope that it will stimulate follow-up studies and the eventual development of suitable theories. As such, this study is exploratory in nature (as opposed to hypotheses-driven).

From an empirical perspective, this analysis is difficult to conduct. The main challenge is to find a control group that provides a counterfactual of how companies would have behaved had they not been affected by the sharp increase in borrowing costs during the crisis. To obtain such a control group, we exploit the sudden nature of the credit crunch, which started with the “panic” of August 2007. The panic was triggered by the sudden collapse of the market for mortgage-backed securities (MBS), which led to a sharp reassessment of credit risk. As a result of the panic, the cost of credit skyrocketed. This is best seen in Figure 1, which plots the evolution of the TED spread around that period.⁴ In July 2007, the TED spread was about 50 basis points. It jumped to about 200 basis points in August 2007 and remained high thereafter.

This sharp discontinuity in the TED spread—and hence in firms' cost of debt financing—provides a useful quasi-experiment that can be illustrated with a simple example. Consider two firms (firm A and firm B) that borrowed a large amount of debt around mid-1997. This long-term debt is scheduled to mature (and be rolled over) in 10 years, that is, around mid-2007. Assume that firm A's debt matures in July 2007, while firm B's debt matures in August 2007. Arguably, whether the firm contracted this debt in July or August 1997 is as good as random.

⁴The TED spread is the difference between the 3-month LIBOR rate (pertaining to short-term interbank debt) and the 3-month Treasury bill rate (pertaining to short-term U.S. government debt). It is the most commonly used benchmark in the pricing of commercial loans, as it provides an informative metric of credit risk in the corporate sector. Intuitively, the TED spread compares the return banks charge when they lend money to each other (which in turn reflects the credit risk of their corporate borrowers) to the return they charge for a risk-free loan (i.e., a loan to the U.S. government). The difference between the two isolates the risk premium charged by banks for bearing borrowers' default risk, which is then used as a benchmark for the pricing of loans.

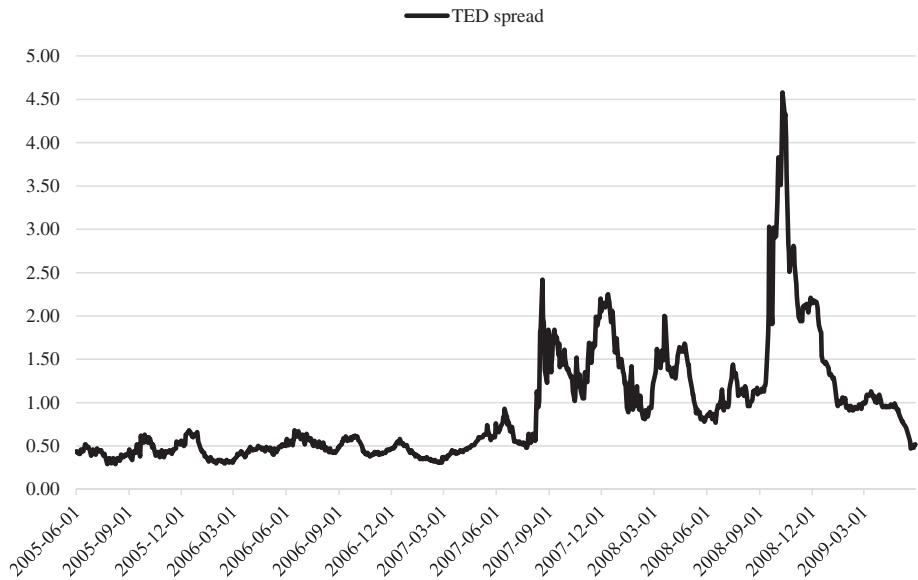


FIGURE 1 Evolution of financing costs. This figure plots the daily TED spread from June 2005 until June 2009. The TED spread is the difference between the 3-month LIBOR rate and the 3-month Treasury bill rate. The data are obtained from the St. Louis Fed

Yet, the sharp discontinuity in the borrowing costs after the panic of August 2007 has dramatic consequences for the financing costs faced by both companies when rolling over their debt. While firm A faces pre-crisis financing costs, firm B faces financing costs that are an order of magnitude higher. In other words, this setup provides a (quasi-)random assignment of high versus low financing costs—and hence the extent to which companies are hit by the disruption of credit markets—that can be used to identify the causal impact of the credit crunch on firms' investment strategies during the crisis.

In this setup, the control group consists of companies whose long-term debt matures shortly before August 2007 (such as firm A in the above example), while the treatment group consists of companies whose long-term debt matures shortly thereafter (such as firm B). Using a difference-in-differences (DID) specification, we then examine how companies adjusted their CAPEX, workforce, R&D, and CSR.

We find that companies significantly reduced their CAPEX and workforce in response to the treatment. Yet, and remarkably, they maintained their pre-crisis levels of R&D and CSR. These findings indicate that companies, on average, responded by following a “two-pronged” approach of simultaneously reducing their workforce and CAPEX, while sustaining their investments in R&D and CSR.⁵ This suggests that innovative capability and stakeholder relationships were seen as instrumental in sustaining firms' competitiveness during the crisis.

⁵Anecdotal evidence is consistent with this two-pronged approach. In particular, commentators were puzzled as to why companies did not seem to reduce their R&D and CSR during the financial crisis. For example, the *Wall Street Journal* noted that “[m]ajor U.S. companies are cutting jobs and wages. But many are still spending on innovation.” (*Wall Street Journal*, 2009). Similarly, *Fortune* noted that “[a]s companies cut costs, social responsibility may seem like an easy target. But many big names are sticking with the program” (*Fortune*, 2009).

Additional evidence is supportive of this interpretation. Specifically, while *on average* firms did not reduce their investments in R&D and CSR, we find that they did reduce R&D and CSR in industries that are less R&D-intensive and less CSR-sensitive, respectively—that is, in industries where firms' competitiveness is less likely to depend on their innovative capability and stakeholder relationships, respectively.⁶

Finally, we examine whether companies that sustained their investments in R&D and CSR performed better in the post-crisis years. We find that they did. Specifically, they achieved a higher return on assets (ROA), higher Tobin's Q, and analysts were more likely to issue a "buy" recommendation for their stock. In contrast, we find that companies that maintained their workforce and CAPEX did not achieve higher performance. Moreover, we find that firms that pursued the two-pronged approach of simultaneously maintaining their R&D and CSR while reducing their workforce and CAPEX achieved an even higher performance in the post-crisis years.

The remainder of this manuscript is organized as follows. In Section 2, we describe the methodology, along with the data used for the analysis. In Section 3, we present the results. Finally, in Section 4, we offer conclusions and discuss potential avenues for future research.

2 | DATA AND METHODOLOGY

2.1 | Data sources and variable definitions

2.1.1 | Dependent variables

The firm-level data are obtained from Standard & Poor's Compustat. Compustat compiles accounting data for U.S. publicly-traded companies, along with industry codes and information on the company's location. In the following, we describe the computation of the main dependent variables.

Workforce. We measure the size of the company's workforce annually by taking the natural logarithm of the number of employees.

CAPEX. To measure annual investments in physical capital, we compute the ratio of capital expenditures (CAPEX) to property, plant & equipment (PPE). To mitigate the impact of outliers, we winsorize this ratio at the 5th and 95th percentiles of its distribution.

R&D. We measure annual investments in R&D by computing the ratio of R&D expenses to total assets. We winsorize this ratio at the 5th and 95th percentiles of its distribution.

CSR. To measure CSR, we use the KLD-index, which is obtained from the Kinder, Lydenberg, and Domini (KLD) database. The KLD-index is widely used in the CSR literature.⁷

⁶In the terminology of capital budgeting, companies invest in projects if the project's internal rate of return (IRR) exceeds the project's cost of capital (or, more precisely, the projects' weighted average cost of capital—the WACC—which is a weighted average of the cost of debt and equity used to finance the project). If the IRR from R&D and CSR projects is sufficiently high, it might remain above the cost of capital even after the massive rise in financing costs. Presumably, in industries that are less R&D-intensive and less CSR-sensitive—that is, in industries in which firms' competitiveness is less likely to depend on R&D and CSR—the IRR from R&D and CSR projects is lower to begin with (reflecting their lower strategic value), and hence more likely to fall below the cost of capital during the credit crunch. This is consistent with our finding that companies did curtail their R&D and CSR projects in industries that are less R&D-intensive and less CSR-sensitive, respectively.

⁷Chatterji, Levine, and Toffel (2009, p. 127) note that "KLD's social and environmental ratings are among the oldest and most influential and, by far, the most widely analyzed by academics."

KLD is an independent social choice investment advisory firm that compiles ratings on companies' performance in addressing the needs of their stakeholders. These ratings are based on multiple data sources including annual questionnaires sent to companies' investor relations offices, firms' financial statements, annual and quarterly reports, general press releases, government surveys, and academic publications. To construct the composite KLD-index, we add up the number of all CSR strengths with respect to employees, customers, the natural environment, and society at large (community and minorities).^{8,9}

Changes during the Great Recession. In the empirical analysis, we examine how companies adjusted the four different types of strategic resources during the Great Recession. Accordingly, we compute the change in these variables from 2007 to 2009, which we denote by $\Delta \log(\text{employees})$, $\Delta \text{CAPEX}/\text{PPE}$, $\Delta \text{R&D}/\text{assets}$, and $\Delta \text{KLD-index}$, respectively.¹⁰

2.1.2 | Control variables

In our baseline specification, we control for numerous firm characteristics measured in 2006 (i.e., prior to the Great Recession), all of which are obtained from Compustat. *Size* is the natural logarithm of the book value of total assets. *ROA* is the ratio of operating income before depreciation to the book value of total assets. *Tobin's Q* is the ratio of the market value of total assets (obtained as the book value of total assets plus the market value of common stock minus the sum of the book value of common stock and balance sheet deferred taxes) to the book value of total assets. *Cash holdings* is the ratio of cash and short-term investments to the book value of total assets. *Leverage* is the ratio of debt (long-term debt plus debt in current liabilities) to the book value of total assets. To mitigate the impact of outliers, all ratios are winsorized at the 5th and 95th percentiles of their distribution. These covariates capture differences in firm size (*size*), profitability (*ROA*), investment opportunities (*Tobin's Q*), financing (*leverage*), and liquidity (*cash holdings*), which may affect subsequent investments in strategic resources.¹¹

2.1.3 | Loan data

The loan information is obtained from Thomson Reuters Loan Pricing Corporation's (LPC) Dealscan, which contains detailed information on loans issued by financial institutions (such as

⁸In addition to CSR strengths, the KLD database also contains a list of CSR weaknesses, labeled "concerns." Accordingly, an alternative approach is to construct a "net" KLD index by subtracting the number of concerns from the number of strengths. However, recent research suggests that this approach is methodologically questionable. More specifically, KLD strengths and concerns lack convergent validity—using them in conjunction fails to provide a valid measure of CSR (e.g., Mattingly & Berman, 2006). Nevertheless, in robustness checks we show that we obtain similar results if we use the net KLD-index.

⁹Note that, the KLD-index is only an indirect measure of "investments in CSR." This caveat arises due to the fact that companies do not report CSR expenses as a separate item in their income statement. Rather CSR expenses are combined with other types of expenses (and listed as part of, e.g., selling, general, and administrative expenses (SG&A) or "other expenses"). For this reason, the common practice in the literature has been to rely on changes in CSR indices as proxies for "investments" in CSR (e.g., Flammer & Bansal, 2017; Ioannou & Serafeim, 2015; Kacperczyk, 2009; McWilliams & Siegel, 2000).

¹⁰For example, $\Delta \log(\text{employees}) = \log(\text{employees}_{2009}) - \log(\text{employees}_{2007})$.

¹¹Appendix A compiles the list of variables used in the analysis.

commercial banks and investment banks) to U.S. companies.¹² Dealscan¹ captures a substantial share of the loan market. Carey and Hrycay (1999) estimate that Dealscan loans cover between 50% and 75% of the volume of loans issued to U.S. corporations. For each loan, Dealscan provides a wealth of information including the issue date, maturity date, and loan amount. We match Dealscan to Compustat using the bridge of Chava and Roberts (2008).

The average loan in our sample has a principal amount of \$547M, an interest of 6.1%, and a maturity of 4.3 years; 87% of the loans are amortizing loans (i.e., the amount of principal is paid down over the life of the loan), while the remaining 13% are bullet loans (i.e., the principal is repaid at maturity). Roberts and Sufi (2009) study the extent to which Dealscan loans are renegotiated ex post. They find that renegotiation is common, but “rarely a consequence of distress or default” (p. 159). Moreover, they find that, when the terms are renegotiated (such as the interest on the loan), this is usually done at the prevailing market conditions. Accordingly, renegotiation is unlikely to affect our results—firms whose long-term debt matures shortly before August 2007 are unlikely to renegotiate (as they would be facing post-crisis credit conditions), while firms whose long-term debt matures shortly after August 2007 are unlikely to obtain better terms.

2.2 | Methodology

2.2.1 | The (quasi-)experiment

The financial crisis started with a sharp drop in house prices in 2006, which in turn triggered a wave of default of subprime mortgages going into 2007. The increase in subprime defaults in the first half of 2007 led to massive losses on MBS and ultimately the collapse of the MBS market.¹³

One of the triggering events was the run on the assets of three MBS-based structured investment vehicles (SIV) of BNP Paribas at the beginning of August. This run informed investors that MBS were no longer safe, which led to a major reassessment of the risk of debt instruments and the “panic” of August 2007 (also known as the “credit crunch” of August 2007). Almost overnight, the cost of borrowing sky-rocketed. This is best seen in the aforementioned Figure 1 that shows a sharp discontinuity in the TED spread at the beginning of August. While the TED spread was around 40–50 basis points in the pre-crisis period, it jumped to about 200 basis points in August 2007 and remained high thereafter (peaking at about 460 basis points in October 2008).

This sharp discontinuity in borrowing costs during the panic of 2007 provides the (quasi-) experimental setting we exploit in this paper. Companies whose long-term debt matures shortly before August 2007 are able to roll over their debt at pre-crisis conditions, whereas companies whose long-term debt matures shortly after August 2007 face refinancing costs that are an order of magnitude higher. Importantly, there is no reason to expect any systematic differences between companies whose debt was set to mature shortly before versus shortly after August. In experimental terms, this implies that the “assignment to treatment” (i.e., to high versus low

¹²Many of these loans are syndicated (i.e., they are issued by a “syndicate” of two or more financial institutions). For a detailed description of the Dealscan dataset, see Chava and Roberts (2008).

¹³See Acharya, Philippon, Richardson, and Roubini (2009), Brunnermeier (2009), and Gorton (2010) for a description of the various factors that led to the financial crisis.

borrowing costs) is quasi-random. In turn, this allows us to study the causal impact of the credit crunch on firms' investments in their key strategic resources.¹⁴

Using this empirical setting, we define the *control group* as those firms in the matched Compustat-Dealscan universe who have debt that matures within 6 months prior to August 2007 (382 firms). Similarly, we define the *treatment group* as those firms whose debt matures within 6 months after August 2007 (288 firms).¹⁵ In robustness checks, we show that our results are similar if we use different time windows (3, 9, and 12 months, respectively).

An advantage of using Dealscan is that it only includes large loans. By construction, this guarantees that the debt position that is rolled over is substantial.¹⁶ As discussed above, the cost of debt skyrocketed following the panic of August 2007. For the treated firms, it increased from 5.8 percentage points prior to the treatment to 9.8 percentage points thereafter (i.e., it increased by 4% points, corresponding to a 70% increase). Since the amount of debt rolled over by the treated firms was \$512M, this implies an increase in the annual interest expense by $\$512M \times 4\% = \$20M$.¹⁷ While this increase may seem small in absolute terms, it was quite large compared to the treated firms' profits during the crisis. Specifically, the average annual earnings of the treated firms were \$336M during the crisis period of 2007–2009. Hence, the higher cost of debt wiped out about 6% of their profits per year.^{18,19}

2.2.2 | Covariate balance

The identifying assumption behind our analysis is that the assignment to the treatment versus control group is "as good as random." Importantly, this identifying assumption is testable—to the extent that the assignment is (quasi-)random, there should be no *ex ante* differences between firms in the treatment versus control group. To examine whether this is the case, in Panel A of Table 1, we contrast various characteristics measured in 2006 (i.e., prior to the crisis). As can be seen from the last two columns (which report the *p*-value of the difference-in-means

¹⁴This design is similar in spirit to a regression discontinuity design (RDD), in which we compare firms that are marginally above vs. below a discontinuity threshold—in our case, firms whose long-term debt matures marginally before vs. after the panic of August 2007. The RDD methodology is often seen as the sharpest tool of causal inference since it approximates very closely the ideal setting of randomized control experiments (see Lee & Lemieux, 2010, p. 282).

¹⁵If a company has loans that mature during both the control and treatment periods, we assign the firm to the control or treatment group depending on which amount is larger. In Appendix C, we show that our results are not sensitive to the coding of these firms.

¹⁶Notice that the loans are rolled over at a full principal amount, and hence the distinction between "loan amount" and "principal amount" is immaterial in our context.

¹⁷Note that for bullet loans (13% of the loans in our sample), no interest is paid until maturity. That said, these loans still entail a "hidden interest" in that the bullet payment at maturity will reflect the accumulated interest.

¹⁸Another informative benchmark is the pretreatment capital expenditures, which are on average \$407M for the treated firms. Hence, the higher interest expense of \$20M corresponds to about 5% of the firm's annual capital expenditures in noncrisis times.

¹⁹In auxiliary analyses we distinguish between large versus small treatments, depending on whether the amount of debt that is rolled over (as a fraction of the firm's assets) is above versus below the median across all treated firms. For above-median treatments, the higher debt burden wiped out about 18% of the treated firms' profits per year.

TABLE 1 Summary statistics

		Obs.	Mean	Median	SD	<i>p</i> -value (diff. in means)	<i>p</i> -value (diff. in medians)
<i>Panel A. Pre-crisis characteristics</i>							
Size	Treated	288	7.313	7.308	1.825	.298	.155
	Control	382	7.612	7.488	1.953		
ROA	Treated	288	0.130	0.126	0.115	.764	.192
	Control	382	0.132	0.121	0.086		
Tobin's Q	Treated	288	1.836	1.538	1.014	.280	.319
	Control	382	1.644	1.344	0.869		
Leverage	Treated	288	0.279	0.247	0.203	.344	.380
	Control	382	0.290	0.275	0.202		
Cash holdings	Treated	288	0.104	0.055	0.128	.356	.207
	Control	382	0.088	0.046	0.110		
Log (employees)	Treated	288	1.392	1.303	1.834	.303	.168
	Control	382	1.507	1.508	1.728		
CAPEX/PPE	Treated	288	0.237	0.206	0.147	.617	.344
	Control	382	0.231	0.203	0.143		
R&D/assets	Treated	134	0.042	0.017	0.068	.220	.174
	Control	161	0.030	0.008	0.068		
KLD-index	Treated	217	1.719	1.000	2.760	.458	.998
	Control	286	1.549	1.000	2.222		
<i>Panel B. Amount of debt financing maturing around August 2007</i>							
Amount (\$M)	Treated	288	512.2	150.0	1,725.9	.546	.253
	Control	382	573.9	200.0	1,452.7		
<i>Panel C. Industry demand prior to the crisis (2002–2006)</i>							
Sales growth (ind.)	Treated	288	0.070	0.065	0.047	.414	.923
	Control	382	0.067	0.065	0.046		

and difference-in-medians, respectively), there is no significant difference between the two groups, which lends support to our identification.

In Panel B, we report the average loan amount in each group. As is shown, the amount is slightly smaller in the treatment group. Yet, and importantly, the difference is insignificant.

Finally, in Panel C, we report sales growth from 2002 to 2006 (i.e., during the run-up period leading up to the financial crisis) in the firm's industry to examine whether treated and control firms faced different demand conditions prior to the treatment. Again, we find no significant difference between the two groups.

2.2.3 | DID specification

We estimate companies' responses to the treatment by estimating the following regression:

$$\Delta y_i = \alpha_j + \beta \times \text{treatment}_i + \gamma' \mathbf{X}_i + \varepsilon_i, \quad (1)$$

where i indexes firms and j indexes industries (2-digit SIC major groups); α_j are industry fixed effects; Δy is the change in the variable of interest—that is, $\log(\text{employees})$, CAPEX/PPE , $\text{R&D}/\text{Assets}$, KLD-index —from 2007 to 2009; $treatment$ is the treatment dummy that is equal to one for companies in the treatment group (and zero for companies in the control group); \mathbf{X} is the vector of control variables, which includes *size*, *cash holdings*, *leverage*, *ROA*, and *Tobin's Q* (all measured in 2006); ε is the error term. Throughout the analysis, we cluster standard errors at the industry level to account for potential dependence across firms that have similar operations. The coefficient of interest is β , which captures the DID, that is, the difference between Δy among the treated firms and Δy among the control firms.

Note that, specification (1) is set up as a cross-sectional regression (in which Δy captures the change in outcomes around the treatment). An alternative way to set up the DID is by pooling all firm-year observations before and after the treatment in a panel regression of y (in lieu of Δy) that includes firm and year fixed effects. In robustness checks, we show that we obtain similar results if we use this alternative specification.²⁰

3 | RESULTS

3.1 | Main results

Table 2 reports estimates from the DID specification in Equation (1), that is, a regression of the four dependent variables (which all capture *changes* in firms' resources) on the treatment dummy.²¹

In Column (1), we find that treated companies—that is, companies that are hit more strongly by the sharp increase in borrowing costs during the financial crisis—laid off more employees. The coefficient of $-.023$ (p -value = .014) implies that treated firms reduced their workforce by 2.3% compared to control firms.

In Column (2), we observe a similar pattern for physical investment. Specifically, the coefficient of $-.021$ (p -value = .042) implies that treated firms reduced their capital expenditures by 2.1% of PPE compared to control firms. This indicates that employment and physical investment were adjusted in a similar manner during the financial crisis.

In contrast, in Columns (3) and (4), we find virtually no change in R&D spending and CSR. Both coefficients are small in economic terms and statistically insignificant (p -values of .677 and .838, respectively). Overall, the findings in Table 2 are consistent with a “two-pronged” response: companies responded to the sharp increase in borrowing costs during the financial

²⁰The choice of the cross-sectional specification as baseline is guided by the economics literature on the financial crisis. In this literature—e.g., Mian and Sufi (2014), Mian, Rao, and Sufi (2013)—researchers typically use the cross-sectional setup to study how regional heterogeneity (e.g., county-level variation in house prices) affected changes in employment and consumption during the crisis.

²¹The full regression output with controls is provided in Appendix B.

TABLE 2 The effect of the credit crunch on firms' investment strategies

	$\Delta \text{Log(Employees)}$ (1)	$\Delta \text{CAPEX/PPE}$ (2)	$\Delta \text{R&D/assets}$ (3)	$\Delta \text{KLD-index}$ (4)
Treatment	-0.023 (0.009)	-0.021 (0.010)	0.001 (0.001)	-0.013 (0.063)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	670	670	295	503
R-squared	.06	.08	.15	.03

Note: Standard errors (reported in parentheses) are clustered at the industry level.

crisis by reducing their workforce and CAPEX, while they sustained their investments in R&D and CSR. This suggests that innovation and stakeholder relations were seen as instrumental in sustaining firms' competitiveness during the crisis.

In Appendix C, we present several robustness checks that are variants of the specification used in Table 2.²² In Appendix D, we discuss the external validity of our findings.

3.2 | Substitution

The results in Table 2 suggest that companies responded to the credit crunch by substituting R&D and CSR for capital and labor. In Table 3, we provide direct evidence for this substitution. Specifically, we focus on the common sample in which all four dependent variables are available, and consider as dependent variables the change in four ratios, namely *R&D/employees*, *R&D/CAPEX*, *KLD-index/employees*, and *KLD-index/CAPEX*. As is shown, we find that all four ratios increase following the treatment (with *p*-values ranging from .000 to .047), consistent with the argument that firms substitute R&D and CSR for capital and labor.²³

The substitution between CSR and labor warrants more discussion. Intuitively, employee layoffs may seem at odds with firms maintaining their CSR. In this regard, it is important to highlight that layoffs are not necessarily inconsistent with socially responsible practices—in

²²Specifically, we obtain similar results if we (a) consider alternative debt maturity cutoffs for the quasi-experiment; (b) use the common sample in which none of the dependent variables is missing; (c) control for the 2006 level along with the 2002–2006 change (i.e., the “pretrend”) in the dependent variables; (d) estimate all four regressions jointly using the seemingly unrelated regressions (SUR) estimator; (e) distinguish between the manufacturing sector and other sectors; (f) use an alternative definition of the treatment group; (g) use alternative functional forms; (h) use the “net” KLD-index (based on CSR strengths and CSR concerns); (i) distinguish between “inputs” and “output” provisions of the KLD-index; (j) use KLD subindices pertaining to different stakeholder groups; (k) use ASSET4 data (in lieu of KLD data) to measure CSR; and (l) use the panel formulation of the DID. We further present placebo tests based on m) a “placebo panic” and n) the random assignment of firms whose debt does not mature during the relevant treatment window into arbitrary treatment and control groups.

²³Note that, since the four ratios are computed within firms (i.e., they capture the *within-firm* reallocation of resources), this analysis also mitigates concerns that our results may be driven by variation across firms.

TABLE 3 Substitution of R&D and CSR for capital and labor

	Δ R&D/ employees (1)	Δ R&D/ CAPEX (2)	Δ KLD-index/ employees (3)	Δ KLD-index/ CAPEX (4)
Treatment	0.661 (0.269)	0.135 (0.037)	0.069 (0.026)	0.012 (0.006)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	221	221	221	221
R-squared	.07	.15	.08	.11

Note: Standard errors (reported in parentheses) are clustered at the industry level.

fact, it is perfectly possible for a company to lay off employees to maintain cash flows during times of crisis while using some of those cash flows to sustain their investments in CSR, including employee-related dimensions of CSR. A case in point is the recent example of layoffs at Airbnb. Due to the recent COVID-19 crisis and a sharp drop in Airbnb's revenues, the company had to lay off around 1,900 employees out of a total workforce of about 7,500. However, Airbnb was widely praised for the responsible handling of these layoffs: the laid off employees not only kept their health insurance for 12 months and were allowed to keep their laptops forever, but also, Airbnb set up job support processes for them, including a placement and careers team, so as to enable them to find new job opportunities.²⁴ As this example highlights, a company can be socially responsible even when it is pushed to lay off employees due to a major crisis.

3.3 | Intensity of treatment

In Table 2, *treatment* was a binary variable indicating whether the company's long-term debt was scheduled to be rolled over shortly before versus after the panic of August 2007.

In Panel A of Table 4, we distinguish between large versus small treatments, depending on whether the amount of debt that is rolled over (as a fraction of the firm's assets) is above versus below the median across all treated firms. As can be seen, we find that the reduction in CAPEX and employment is large and significant for above-median treatments (while it is small and insignificant for below-median treatments). Interestingly, we continue to find no change in R&D and CSR investments regardless of the intensity of the treatment.

In Panel B of Table 4, we obtain similar results if instead of sorting treated firms based on the amount of debt that is rolled over, we sort them based on the maturity of the loans that are rolled over.²⁵

²⁴For more details about the CEO's justification and further benefits that laid off employees received, see their CEO's blog post, available at <https://news.airbnb.com/a-message-from-co-founder-and-ceo-brian-chesky/>.

²⁵Relatedly, in Appendix E, we show that the decrease in workforce and CAPEX is mitigated for cash-rich firms.

TABLE 4 Intensity of treatment

Panel A. Loan amount		Δ Log(Employees) (1)	Δ CAPEX/PPE (2)	Δ R&D/assets (3)	Δ KLD-index (4)
Treatment × above-median loan amount		−0.036 (0.012)	−0.031 (0.013)	0.002 (0.002)	−0.019 (0.074)
Treatment × below-median loan amount		−0.013 (0.011)	−0.012 (0.013)	−0.001 (0.002)	−0.005 (0.079)
Controls	Yes		Yes	Yes	Yes
Industry fixed effects	Yes		Yes	Yes	Yes
Observations	670		670	295	503
R-squared	.06		.08	.15	.03
Panel B. Loan maturity		Δ Log(Employees) (1)	Δ CAPEX/PPE (2)	Δ R&D/ assets (3)	Δ KLD-index (4)
Treatment × above-median loan maturity		−0.031 (0.012)	−0.027 (0.014)	0.000 (0.001)	−0.016 (0.074)
Treatment × below-median loan maturity		−0.016 (0.012)	−0.015 (0.013)	0.001 (0.002)	−0.011 (0.077)
Controls	Yes		Yes	Yes	Yes
Industry fixed effects	Yes		Yes	Yes	Yes
Observations	670		670	295	503
R-squared	.06		.08	.15	.03

Note: Standard errors (reported in parentheses) are clustered at the industry level.

3.4 | The drop in consumer demand

While our quasi-experimental setup allows us to isolate the effect of the cost of debt during the financial crisis (holding constant the drop in consumer demand, as well as other macroeconomic disruptions), this is not to say that the collapse in consumer demand was not important. Indeed, what our empirical design captures is not merely a “quasi-random increase in the cost of debt” but instead a “quasi-random increase in the cost of debt at the time of the most severe recession since the Great Depression.”

We examine the role of consumer demand in Table 5. Specifically, we interact *treatment* with a dummy variable that indicates whether the 2007–2009 drop in sales in the firm's industry was in the top quartile across all industries. We find that the reduction in CAPEX and employment is significantly larger in those industries. Interestingly, we continue to find no change in R&D and CSR investments.

3.5 | Why did firms maintain their R&D and CSR?

Our baseline results show that companies followed a two-pronged approach in response to the sharp increase in borrowing costs during the financial crisis: while they curtailed their workforce and CAPEX, they sustained their investments in R&D and CSR. While the reduction in workforce and CAPEX is intuitive—and consistent with the finance literature documenting a reduction in physical investment in response to the credit crunch (e.g., Almeida et al., 2011; Campello et al., 2010; Duchin et al., 2010)—it is unclear why companies maintained their R&D and CSR. In the following, we examine three potential mechanisms.

3.5.1 | Benefits of innovation and stakeholder relations during the crisis

One potential explanation is that R&D and CSR were seen as instrumental in sustaining firms' competitiveness during the financial crisis. To examine this argument, we exploit cross-industry variation in the strategic relevance of R&D and CSR for firms' competitiveness. In particular, in industries with low R&D intensity, firms' competitiveness is less likely to depend on their innovative capability, and hence companies may be more inclined to cut R&D budgets in response to the credit crunch. Similarly, companies operating in less CSR-sensitive industries might be more inclined to curtail their CSR. We explore these dimensions in Panel A of Table 6.

TABLE 5 The amplifying role of the drop in consumer demand

	Δ Log(Employees) (1)	Δ CAPEX/PPE (2)	Δ R&D/assets (3)	Δ KLD-index (4)
Treatment	-0.017 (0.010)	-0.015 (0.010)	0.001 (0.001)	-0.012 (0.068)
Treatment × high drop in demand	-0.025 (0.013)	-0.024 (0.012)	-0.001 (0.002)	-0.005 (0.112)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	670	670	295	503
R-squared	.06	.08	.15	.03

Note: Standard errors (reported in parentheses) are clustered at the industry level.

TABLE 6 Heterogeneity in firms' response

Panel A. Strategic relevance of R&D and CSR		Δ R&D/assets (1)	Δ KLD-index (2)		
Treatment		0.003 (0.003)	0.043 (0.068)		
Treatment × low R&D intensity		-0.012 (0.005)			
Treatment × B2B sector			-0.164 (0.077)		
Controls	Yes		Yes		
Industry fixed effects	Yes		Yes		
Observations	295		503		
R-squared	.15		.03		
Panel B. Uncertainty		Δ Log(Employees) (1)	Δ CAPEX/PPE (2)	Δ R&D/assets (3)	Δ KLD-index (4)
Treatment		-0.023 (0.010)	-0.020 (0.010)	0.001 (0.001)	-0.013 (0.071)
Treatment × high uncertainty		-0.002 (0.013)	-0.004 (0.012)	-0.000 (0.001)	0.002 (0.105)
Controls	Yes		Yes	Yes	Yes
Industry fixed effects	Yes		Yes	Yes	Yes
Observations	670		670	295	503
R-squared	.06		.08	.15	.03

Note: Standard errors (reported in parentheses) are clustered at the industry level.

R&D-intensive industries. In Column (1), we examine whether companies in less R&D-intensive industries reduced their R&D during the meltdown. We construct a measure of R&D intensity at the industry level by computing the ratio of R&D expenses to total assets for all Compustat firms in 2006. We then compute the average across all firms in any given 2-digit SIC industry (*R&D intensity*), and re-estimate our baseline R&D regression, interacting *treatment* with a dummy variable that indicates whether *R&D intensity* is in the bottom quartile across all industries. Consistent with the above argument, we find that companies in less R&D-intensive industries did significantly reduce their R&D (*p*-value = .012).

CSR-sensitive industries. Relatedly, the strategic value of CSR is likely lower in industries that are less CSR-sensitive—that is, industries where stakeholder support plays a marginal role

for firms' competitiveness and survival.²⁶ A prime example of industries that are less CSR-sensitive are B2B industries (e.g., Corey, 1991; Lev, Petrovits, & Radhakrishnan, 2010).²⁷ We examine this dimension in Column (2), where we contrast B2B versus B2C industries. Specifically, we re-estimate our baseline CSR regression, interacting *treatment* with a dummy variable indicating whether the company operates in the B2B sector (the classification of B2B versus B2C industries is obtained from Lev et al., 2010, p. 188). As is shown, we find that firms in the B2B sector significantly decreased their CSR (*p*-value = .034).

Overall, these results indicate that—although on average companies did not reduce their R&D and CSR during the crisis—they did curtail them in industries where innovation and stakeholder relations, respectively, are likely to be of lower strategic importance to firms' competitiveness.

3.5.2 | Real options

Another potential explanation of our findings is that—in the spirit of the real option literature—it could be that the “option to delay” is less valuable for R&D and CSR projects, and hence companies prefer not to delay these projects. If the real option argument has bearing in our context, our findings should vary depending on the degree of uncertainty (as higher uncertainty increases the value of the option to delay).

We examine this argument in Panel B of Table 6. We use the firm's stock volatility as a measure of uncertainty. Following Gormley and Matsa (2016, p. 452), we compute a firm's stock volatility as the square root of the sum of the squared daily returns from CRSP (the Center for Research in Security Prices), normalized by the number of trading days during the year. We then interact *treatment* with a dummy that indicates whether the firm's stock volatility is in the top quartile across all firms prior to the treatment (i.e., in 2006). As is shown, we find that our results are unaffected by the degree of uncertainty, which is inconsistent with the real option argument.

3.5.3 | Stickiness

An alternative explanation of our nonresult for R&D is that R&D investments might be “sticky” and hence difficult to undo in the short run. This alternative is mitigated by the above finding that companies in less R&D intensive industries did curtail their R&D. Indeed, this finding implies that R&D is not always and inherently sticky, since we identify conditions under which

²⁶Anecdotal evidence is consistent with this argument. Indeed, in commenting on the fact that companies seemed to hold on to their CSR programs during the Great Recession, Eric Biel, managing director of corporate responsibility at global public relations firm Burson–Marsteller stated that “[t]hose that still see environmental and social performance as largely divorced from their core business model and overall reputation are more likely to cut back in these tough times” (Fortune, 2009).

²⁷Lev et al. (2010) show that individual consumers are more sensitive to companies' CSR engagement than industrial buyers, which reflects inherent differences in the purchasing decision-making process. More precisely, “[t]he purchasing decision of an individual consumer is affected not only by product attributes, but also by social group forces, psychological factors, and the consumer's situational forces. In contrast, in industrial purchasing, the decision-making process is highly formalized, using defined procurement procedures, and subject to economic (cost/value) analysis” (Lev et al., 2010, p. 186, adapted from Corey, 1991).

TABLE 7 Alternative rationales for maintaining R&D

	Δ R&D/ assets (1)	Δ R&D/ assets (2)	Δ R&D/ assets (3)	Δ R&D/assets (4)
Treatment	0.004 (0.004)	0.004 (0.004)	0.003 (0.004)	0.003 (0.003)
Treatment × low R&D intensity	-0.010 (0.005)	-0.011 (0.005)	-0.011 (0.006)	-0.012 (0.005)
Treatment × short R&D cycle	-0.006 (0.004)			
Treatment × high R&D volatility		-0.002 (0.005)		
Treatment × high incremental R&D			-0.001 (0.005)	
Treatment × non-IDD state				-0.000 (0.006)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	295	295	295	295
R-squared	.15	.15	.15	.15

Note: Standard errors (reported in parentheses) are clustered at the industry level.

it did in fact decrease. Relatedly, our findings indicate that R&D is maintained precisely in those industries where R&D is relatively more important for competitiveness. Put differently, our findings indicate that the potential stickiness of R&D is linked to its importance for competitiveness, which suggests that the strategic importance of R&D may very well be an *antecedent* of its stickiness, at least to some extent.²⁸

Nevertheless, it could be that R&D is sticky for reasons that are nonstrategic (and happen to be correlated with R&D intensity). For example, in industries with long R&D cycles, R&D may be difficult to adjust regardless of its strategic value. In Columns (1) and (2) of Table 7, we explore whether such “mechanical” sources of stickiness may explain our findings. To do so, we estimate a variant of our R&D regression in which, in addition to the interaction between the treatment and R&D intensity (which captures the strategic importance of R&D), we also include an interaction between the treatment and other variables that may capture mechanical

²⁸As additional evidence in support of the strategic motive, we find that firms that did not drop their R&D had on average longer time horizons. To measure organizational time horizons, we use the long-term index of Flammer and Bansal (2017), and find that the long-term index of firms that did not drop their R&D is on average 12.3% higher (*p*-value = .000), consistent with a strategic motive in the R&D response.

forms of stickiness, namely (i) the length of R&D cycles in the firm's industry and (ii) R&D volatility at the firm level. (The latter captures the idea that, if a firm's R&D shows little fluctuations over time, it is likely to be stickier to begin with.) These regressions are informative in that, if our results were unrelated to the strategic importance of R&D, our interaction between the treatment and R&D intensity should become insignificant upon including these additional interaction terms.

To capture R&D cycles, we use the list of industries with short versus long product development cycles compiled by Bushman, Indjejikian, and Smith (1996). We then construct an indicator variable, *short R&D cycle*, that is equal to one if the firm operates in an industry with a short product development cycle. To capture R&D volatility at the firm level, we use quarterly accounting data from Compustat, and compute the standard deviation of the company's R&D to asset ratio over the 12 quarters that precede the treatment. We then construct an indicator variable, *high R&D volatility*, that is equal to one if R&D volatility is in the top quartile across all firms.

As is shown, we find that the coefficient of *treatment* \times *short R&D cycle* (Column (1)) and *treatment* \times *high R&D volatility* (Column (2)) are both negative (with *p*-values of .154 and .660, respectively), consistent with the notion that companies are more inclined to reduce R&D when it is less sticky to begin with. Importantly, however, accounting for these dimensions of stickiness does not overturn our previous finding. Indeed, the coefficient of *treatment* \times *low R&D intensity* remains similar to before, consistent with the strategic motive.

In Columns (3) and (4), we examine two additional dimensions that may capture other forms of R&D stickiness. In Column (3), we distinguish between incremental versus exploratory R&D. To do so, we construct an indicator variable, *high incremental R&D*, that is equal to one if the share of the firm's patents that are incremental (computed as in Benner & Tushman, 2002, using data from the NBER patent database) is in the top quartile across all firms. In Column (4), we consider different knowledge appropriation regimes, which we capture through the indicator variable *non-IDD state* that is equal to one if the firm is located in a state that has rejected the inevitable disclosure doctrine (IDD).²⁹ As is shown, we find again that accounting for these characteristics does not overturn our finding that companies are more likely to curtail R&D in less R&D intensive industries.

Overall, the evidence from Table 7 reinforces our interpretation that, at least to some extent, firms maintaining their R&D is likely to reflect a strategic motive as opposed to being purely mechanical or reflective of other features of the R&D process.³⁰

3.6 | Firm performance

In Table 8, we examine whether companies that maintained their investments in R&D and CSR in response to the credit crunch achieved higher performance during the recovery—to the extent that these strategies helped sustain their competitiveness, companies that held on to them during the crisis may have benefited in the post-crisis period.

²⁹The list of states that rejected the IDD is obtained from Flammer and Kacperczyk (2019). For a description of the IDD, see, for example, Gilson (1999) and Png and Samila (2015).

³⁰Relatedly, our non-finding of a CSR response may reflect some form of stickiness in CSR. In this regard, the evidence provided in Panel A of Table 6 is again useful, as it shows that firms did curtail their CSR in industries where CSR is likely less relevant for firms' competitiveness. This again points at a strategic motive in the firms' response.

TABLE 8 Firm performance in the post-crisis years (2010–2011)

	ROA	Tobin's Q	Analysts' recommendations		
			Buy	Hold	Sell
	(1)	(2)	(3)	(4)	(5)
No reduction in R&D and KLD-index, and reduction in workforce and CAPEX	0.028 (0.012)	0.041 (0.021)	0.130 (0.071)	0.034 (0.032)	-0.164 (0.048)
No reduction in R&D and KLD-index, and no reduction in workforce and CAPEX	0.016 (0.013)	0.017 (0.018)	0.077 (0.066)	0.010 (0.022)	-0.087 (0.052)
Reduction in R&D and KLD-index, and no reduction in workforce and CAPEX	0.004 (0.011)	0.004 (0.018)	0.006 (0.102)	0.017 (0.015)	-0.023 (0.078)
Controls	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	204	204	204	204	204
R-squared	.38	.53	.08	.08	.07

Note: Standard errors (reported in parentheses) are clustered at the industry level.

To examine this question, we regress post-crisis performance—that is, the average ROA in 2010–2011—on a set of dummy variables that indicate how the company responded to the credit crunch. These dummy variables span the (2×2) matrix of potential responses depending on whether companies (i) reduced versus maintained their workforce and CAPEX and (ii) reduced versus maintained their R&D and CSR. (The base group consists of firms that reduced all four resources.) The regression further includes industry fixed effects and the vector of control variables \mathbf{X} used in regression (1). To mitigate the impact of outliers, we winsorize ROA at the 5th and 95th percentiles of its empirical distribution.³¹

As can be seen from Column (1), companies that maintained their R&D and CSR achieved higher performance post crisis, and even more so if they followed the two-pronged approach of maintaining their R&D and CSR while reducing their workforce and CAPEX. In the latter case, the reported coefficient of 0.028 (p -value = .019) indicates that ROA increased by 2.8 percentage points compared to the base group. Since the pretreatment ROA is 0.130 (Table 1), this implies

³¹We caution that the performance results presented in this section do not necessarily warrant a causal interpretation. Indeed, while the empirical setup used in Table 2 allows us to study how the sharp increase in the cost of debt affected firms' investment decisions, it does not allow us to establish a causal link between firms' investment decisions and performance. Doing so would require a separate instrument for firms' investment decisions.

that ROA increased by $0.028/0.130 = 21.5\%$.³² This evidence suggests that R&D and CSR were indeed beneficial to firms in maintaining their competitiveness during (and beyond) the crisis.

There are two caveats of using ROA in this context. The first caveat is that, by construction, ROA includes expenses (such as R&D and employee costs). To the extent that expenses have some persistence over time, post-crisis ROA may mechanically reflect our baseline results. Second, ROA captures short-term performance, whereas the strategic investments made during the credit crunch may have longer-term implications.

To mitigate these caveats, we use alternative performance measures in Columns (2)–(5). In Column (2), we use Tobin's Q; in Columns (3)–(5), we use the percentage of analysts who formulate a buy, hold, and sell recommendation, respectively, for the company's stock. The analysts' recommendations are obtained from Thomson–Reuters' IBES (Institutional Brokers Estimate System). The benefit of these measures is that they are forward-looking and not mechanically related to firms' expenses. As can be seen, we obtain similar results when using these alternative metrics.³³

4 | DISCUSSION AND CONCLUSION

How did companies adjust their resource base in response to the sharp increase in the cost of credit (the “credit crunch”) during the financial crisis of 2007–2009? In this exploratory study, we shed light on this question by exploiting the sudden nature of the credit crunch as a source of (quasi-) random variation in the extent to which companies were hit by the higher cost of financing during the crisis.

Our findings indicate that, on average, companies responded by following a two-pronged approach: they significantly reduced their workforce and CAPEX, but sustained their investments in R&D and CSR. This suggests that investments in innovative capability and stakeholder relations were seen as instrumental in maintaining the firm's competitiveness during the financial crisis.

Consistent with this interpretation, we document that, although on average firms did not decrease their investments in R&D and CSR, they did curtail their R&D and CSR in industries with low R&D intensity and low CSR sensitivity, respectively—that is, in industries where innovative capability and stakeholder relations are less likely to contribute to the firm's competitiveness.

Finally, we find that companies that sustained their investments in R&D and CSR exhibit higher performance in the post-crisis years, consistent with the argument that such investments contribute to companies' competitiveness in times of crisis. In contrast, companies that only sustained their workforce and CAPEX did not perform better in the post-crisis years. What is more, we find that companies that pursued the two-pronged approach of simultaneously reducing their workforce and CAPEX while maintaining their investments in R&D and CSR achieved even higher performance in the post-crisis years.

³²The coefficient is larger, but not significantly larger, than the one we obtain for companies that maintained not only their R&D and CSR, but also their workforce and CAPEX.

³³A limitation of the analysis provided in Table 8 is the lower sample size, which is further exacerbated by the decomposition in the (2×2) matrix. While we nevertheless observe noteworthy patterns, we note the lower power of the tests presented in this table.

Our study relates to the large body of work on organizational decline and corporate turnaround (for a review, see Trahms et al., 2013). While the adaptation to external changes has long been studied in this literature, the focus has been on more “traditional” disruptions in the firm’s external environment such as industry decline and business cycle fluctuations (e.g., Aghion, Askenazy, Berman, Cette, & Eymard, 2012; Anand & Singh, 1997; Barlevy, 2007; Fabrizio & Tsolmon, 2014; Ouyang, 2011). In contrast, little is known of firm strategy when financial markets collapse. Such events are (fortunately) rare—the past century witnessed only two such events: the Great Depression of 1929 and the financial crisis of 2007–2009.³⁴ This gap in the literature is highlighted by Agarwal, Barney, Foss, and Klein’s (2009) call for research that examines firms’ strategic actions during the financial crisis. They highlight that none of the existing strategic management theories focuses on firms’ adaptations to extreme events—such as the financial crisis of 2007–2009—that affect companies in complex ways. Given the limited guidance from theory, this study follows Hambrick (2007) and Helfat’s (2007) recommendation to adopt a fact-based, exploratory approach, focusing on documenting the impact of this complex phenomenon on firm-level decision-making in the hope that it will stimulate follow-up studies and the eventual development of suitable theories.

Our study is also related to the growing literature that examines the various mechanisms through which companies can benefit from CSR. In particular, previous work has shown that CSR can help firms differentiate themselves from their competitors (Bettinazzi, Massa, Neumann, & Zollo, 2015; Flammer, 2015a), enhance their ability to recover from unfavorable situations (Bansal, Jiang, & Jung, 2015; Barnett, Darmall, & Husted, 2015; Choi & Wang, 2009; DesJardine, Bansal, & Yang, 2019), strengthen connections with the local communities (Tilcsik & Marquis, 2013), improve labor productivity (Flammer, 2015b; Flammer & Luo, 2017), improve firms’ ability to engage in innovation (Flammer & Kacperczyk, 2016), enhance consumer loyalty (Du, Bhattacharya, & Sen, 2007; Kotler, Heskekiel, & Lee, 2012), improve access to government procurement contracts (Flammer, 2018), and lower capital constraints (Cheng, Ioannou, & Serafeim, 2014), among others. Our finding that companies did not curtail their CSR during the financial crisis echoes this literature, as it suggests that companies see CSR as an important aspect of corporate strategy that help them maintain or even enhance their competitiveness.

Lastly, our study opens up several avenues for future research. In particular, we hope that our fact-based study stimulates future work that builds on our results to develop an integrated theory of how (and why) companies adjust their resource base during financial crises. Such theories could be broadened to include other types of economy-wide crises such as the COVID-19 pandemic. In addition, more empirical evidence is needed. In particular, a finer-grained empirical analysis of the four strategic resources could shed light on the underlying theoretical mechanisms. For example, while our results show that companies laid off employees, an important question is *which* employees were laid off and *why*. Based on our results, one may expect companies to have laid off employees whose role is inessential for competitiveness and long-term survival. Relatedly, future work could examine which types of projects were discontinued and *why*. Examining these questions is a challenging task that requires detailed micro data on the companies’ operations and processes. Making ground on them is a promising avenue for future research.

³⁴This does not mean that financial crises are unlikely. In their review of financial crises over the past 800 years, Reinhart and Rogoff (2009) note that—over a long horizon—financial crises are surprisingly frequent, and will inevitably happen again.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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