

**THE DOG THAT DIDN'T BARK:  
LONG-TERM STRATEGIES IN TIMES OF RECESSION**

CAROLINE FLAMMER  
Ivey Business School  
University of Western Ontario  
1255 Western Road, Office 3351  
London, ON N6G 0N1, Canada  
+1 (519) 661 3144  
[cflammer@ivey.uwo.ca](mailto:cflammer@ivey.uwo.ca)

IOANNIS IOANNOU  
Strategy and Entrepreneurship Area  
London Business School  
Sussex Place, Regent's Park  
London, NW1 4SA, United Kingdom  
+ 44 (0) 20 7000 8748  
[iioannou@london.edu](mailto:iioannou@london.edu)

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**ABSTRACT**

We investigate how U.S. companies adjusted their investments in key strategic resources—i.e., human capital, tangible, and intangible resources—during the Great Recession of 2007-2009. To obtain exogenous variation in the severity of the recession, we exploit the differential intensity of the house price collapse across U.S. regions, instrumenting changes in house prices with Saiz' (2010) topological measure of housing supply elasticity. Our findings indicate that companies significantly laid off employees and curtailed capital expenditures. Importantly though, they did *not* reduce investments in R&D and corporate social responsibility (CSR). We further document that firms that sustained their R&D and CSR performed better once the economy recovered. These findings confirm our theoretical arguments suggesting that intangible strategic resources such as innovation capability and stakeholder relations are instrumental in sustaining a competitive advantage during (and beyond) times of crisis.

Keywords: recession; business cycle; competitive strategy; employment; physical capital; innovation; corporate social responsibility; financial performance.

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*Gregory: "Is there any other point to which you would wish to draw my attention?"*

*Holmes: "To the curious incident of the dog in the night-time."*

*Gregory: "The dog did nothing in the night-time."*

*Holmes: "That was the curious incident."*

Sir Arthur Conan Doyle, *Silver Blaze*

## INTRODUCTION

The recent economic and financial crisis of 2007-2009 had dramatic consequences for individuals, communities, corporations, and governments around the world. In fact, the period of the crisis has been named the "Great Recession" because it is the worst post-World War II contraction on record.<sup>1</sup> 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. Long-term unemployment also rose to historic highs during the same period.

Economic crises like the Great Recession are disruptive for firms across industries, markets, and geographies. Crises of this magnitude trigger discussions about fundamental issues of strategy and radical organizational change as they are typically associated with periods of higher uncertainty (Bloom, 2014), changes in the regulatory and policy framework (Baker *et al.*, 2013; Pastor and Veronesi, 2012; Rodrik, 1996), higher cost of capital and tightened access to external sources of credit (Chodorow-Reich, 2014), disruptions in supply chains (Cattaneo *et al.*, 2010; Levy, 1994), deteriorating consumer demand (Mian *et al.*, 2013), and increased risk of firm failure (Bernanke, 1981; Bhattacharjee *et al.*, 2009). In short, an economic meltdown leaves virtually no aspect of firms' business environment unaffected, unsettles their stakeholder relationships (such as relationships with employees, customers, suppliers, and local communities), and generates a major shift in the competitive landscape. Thus, companies need to fundamentally rethink and potentially reshape their strategies to ensure firm survival and sustain (or even enhance) their competitiveness.

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<sup>1</sup> The National Bureau of Economic Research (NBER) defines a recession as a period of falling economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales.

Despite the severity and frequency of economic crises, we know surprisingly little about their impact on firm-level decision-making and, in particular, on firms' competitive strategies (e.g., Bromiley *et al.*, 2008). This is a significant void in the literature, given that all firms are subject to the macroeconomic business cycle, and that managers are likely to face multiple recessions during their careers. Firm strategies aim to strike the right balance between, on one hand, the development of sustainable competitive advantage in the long-term and, on the other hand, the adaptation to short-term disturbances in the business environment. While the adaptation to external changes has long been a focus within strategic management research, the spotlight has been on relatively incremental changes or changes within a specific industry (e.g., Christensen, 1997; Eisenhardt and Martin, 2000; Helfat *et al.*, 2007; Meyer, 1982; Teece *et al.*, 1997). In contrast, the critical issue of firm strategy in times of major shocks—shocks that adversely impact multiple industries and economies simultaneously, disturbing the entire business environment—remains largely unexplored (Agarwal *et al.*, 2009; Garcia-Sanchez *et al.*, 2014).

In a first effort to fill this gap in the literature, we investigate changes in companies' investment strategies in recessionary times. More specifically, we theorize and empirically examine whether and in which direction firms adapt their strategic investments in human capital, physical capital (tangible), and organizational capital (intangible) resources, all of which are identified in the existing literature as key strategic firm resources in the context of long-term value creation (Barney, 1991).

Whether firms would decrease, maintain, or increase strategic investments is not *a priori* obvious given that a major shock to the business environment presents firms with both challenges as well as opportunities. On one hand, an economic downturn may impair firms' ability to undertake investments in strategic resources (e.g., due to declining revenues, increased market uncertainty, higher cost of capital, and tightened access to the credit market). As a result, they may lay off employees, postpone expansion and infrastructure projects, liquidate assets, delay R&D projects, or eliminate corporate social responsibility (CSR) programs to maintain cash flows. In other words, firms may try to save their way out of recession. On the other hand, a downturn may also represent an opportunity for firms to expand

investments, i.e., to invest their way out of recession. For example, it might generate opportunities to acquire new or expand existing assets at lower cost—given that asset and equity prices typically fall during recessions—or opportunities to hire employees at lower wages (Bils, 1985; Solon *et al.*, 1994). During a recession, firms can also invest in their innovation capability to strengthen their competitiveness for when the economy recovers and consumer demand picks up again. Similarly, investing in CSR programs may enable firms to strengthen their stakeholder relations, thus improving organizational resilience during as well as after such recessionary periods.

Anecdotal evidence abounds with examples of companies decreasing investments in human capital and tangible resources while sustaining their investments in intangible resources—such as innovation and stakeholder relations—during economic crises. For example, while many U.S. companies cut jobs and wages, they continued to spend on innovation (*Wall Street Journal*, 2009). A survey of 290 senior executives and R&D leaders confirms the vital role of innovation in corporate strategy during recessions (Booz & Company, 2009): in an attempt to maintain (and ideally improve) a firm’s competitiveness, the majority of surveyed companies sustains—or even boosts—investments in R&D. For instance, Harman International, a \$3 billion maker of high-end car audio and infotainment systems, stated that it aimed to “emerge leaner, more efficient, and more technologically capable” (Robert Lardon, Booz & Company, 2009, p. 11) from the downturn. Similarly, many innovative products from Apple’s iPod to General Electric (GE)’s fuel-efficient aircraft engines resulted from investments made during economic downturns (*Wall Street Journal*, 2009).

Relatedly, many large companies, including GE, IKEA, Intel, Microsoft, Rio Tinto, Starbucks, and Wal-Mart maintained their investments in CSR programs during the recent recession (*Boston Consulting Group*, 2009; *Fortune*, 2009). For example, GE continued its investments in CSR programs, including citizenship efforts across the globe, the development of environmentally friendly practices and products such as solar panels, clean-coal power plants, etc. (*Fortune*, 2009). A similar view was expressed by Starbucks CEO Howard Schultz who stated during the crisis, “Now is a time to invest, truly and authentically, in our people, in our corporate responsibility and in our communities. The argument—

and opportunity—for companies to do this has never been more compelling” (*Huffington Post*, 2008). Intel’s chairman, Craig Barrett, echoed the view that strategic investments in people and environment could not wait and that stakeholder relations could not be put on the back burner; as he put it in a nutshell, “You can’t save your way out of recession—you have to invest your way out” (*Fortune*, 2009).

Drawing from different strands of literature, we theorize that sustaining investments in intangible strategic resources—such as innovation and stakeholder relationships—in recessionary times is of particular importance to maintain, or potentially enhance, firms’ competitiveness. Specifically, we argue that a strategic focus on these resources can help companies sustain their competitiveness by enabling them to i) become more efficient and innovative, ii) adapt more easily to shifting needs and demands of suppliers, consumers, and other stakeholders, and iii) enhance their organizational resilience. For example, by maintaining investments in R&D projects in a time of crisis (and therefore, in a time of scarcity), companies may find innovative ways to become more efficient, i.e., to do more with less. Relatedly, existing research finds that through experimentation companies are better able to adapt quickly to changes in the business environment (e.g., Eisenhardt and Martin, 2000) and to improve their technological capability. Moreover, information, communication, collaboration, and stakeholder orientation are important factors in the innovation process (e.g., Eisenhardt, 1989; Eisenhardt and Martin, 2000; Flammer and Kacperczyk, 2015). Accordingly, we argue that firms who continue investing in stakeholder relationships are better positioned to understand changing conditions in times of crisis, identify concerns and opportunities, and adapt to shifting needs and expectations of various stakeholders. Furthermore, we argue that superior stakeholder relations become particularly valuable during downturns given that firms are more likely to benefit from, for example, lower price elasticity of demand and higher consumer loyalty (e.g., Du *et al.*, 2007; Kotler *et al.*, 2012), enhanced attractiveness as employer (e.g., Turban and Greening, 1996), reduced risk of social activism and regulatory action (e.g., Baron and Diermeier, 2007; Maxwell *et al.*, 2000), and lower capital constraints (Cheng *et al.*, 2014). Hence, we propose that showing commitment towards stakeholders can help companies improve their organizational resilience through the above mechanisms and, as a result, companies would be able to maintain or even

enhance their competitiveness during the downturn. In line with these arguments, we posit that companies react to macroeconomic meltdowns by strategically sustaining their investments in innovation and stakeholder relationships.

As discussed, to date, the important question of whether firms save or invest their way out of economic crises has been neither theoretically nor empirically addressed in the literature. From an empirical perspective, this question is particularly difficult to answer given that all companies are affected (i.e., “treated”) by a recession; thus, there is no natural “control” group that provides a counterfactual of how companies would have behaved had they not been affected by the recession. Studying the Great Recession helps overcome this empirical challenge since an important feature of the Great Recession—and one that makes it particularly suitable for academic studies—is the role played by house prices. Regions in which the house price collapse was more severe (and hence where a larger fraction of households ended up with negative home equity) experienced a larger drop in households’ purchasing power, leading to a larger drop in consumption (Mian and Sufi, 2011, 2014; Mian *et al.*, 2013). Therefore, the severity of the house price drop provides cross-sectional—more precisely, regional—variation in the severity of the crisis. This cross-sectional variation can be used to study how firms that are more severely affected by the recession (i.e., firms located in regions that experience a larger drop in house prices) adjust their investments in strategic resources compared to firms that are less affected. In spirit, this methodology is similar to a difference-in-differences approach in which we would compare the strategic investments of firms in more affected regions (“treatment group”) with those of firms in less affected regions (“control group”). Using this methodology, we examine how the drop in house prices affects firms’ investments in strategic resources. These are typically classified in the literature as human capital, tangible, and intangible resources (Barney, 1986, 1991). Accordingly, we consider a) the size of the workforce to capture changes in human capital, b) capital expenditures to capture changes in tangible resources, and c) R&D and CSR investments to capture changes in intangible resources.

Our findings indicate that during the Great Recession, companies significantly reduced their workforce and capital expenditures. Yet, and this is a remarkable finding, they maintained the same level

of investments in R&D and CSR. Referring to the opening quote of our study, this result is a “non-barking dog”—i.e., the interesting finding is not so much what companies did, but rather what they did *not* do: they did not decrease their R&D and CSR investments, despite the cost-cutting pressures, heightened uncertainty, and other challenges inherent to periods of recession. Consistent with our theoretical arguments, these findings suggest that intangible resources in the form of innovation capability and stakeholder relations are instrumental in sustaining a firm’s competitiveness during and after recessionary times.

A potential concern with our empirical approach is that changes in house prices might be endogenous with respect to firms’ strategic investments—i.e., unobservable variables may drive both changes in house prices and changes in investment strategies. To address this concern, we use an instrumental variable (IV) approach, whereby we instrument changes in house prices with Saiz’ (2010) topological measure of housing supply elasticity. The intuition is that in regions where it is difficult to build new housing (e.g., due to steep hills or rocky terrain), housing prices are more likely to be sensitive to changes in housing demand. Importantly, the region’s topological features are unlikely to be systematically related to firms’ strategic investments. We find that all our results hold when we use this IV approach.

In auxiliary analyses, we further document that—although on average firms do not cut their investments in R&D and CSR—firms operating in less R&D-intensive and less CSR-sensitive industries, respectively, are more likely to do so. This result is intuitive, yet it offers additional verification for the mechanisms we argue for in our study. For example, in less R&D-intensive industries, firms’ competitiveness is less likely to depend on their innovative capabilities. Similarly, CSR is less likely to enhance competitiveness in industries in which stakeholder engagement is less salient. Finally, we examine whether companies that sustain their investments in R&D and CSR perform better once the economy recovers, and we find that they do. Specifically, they achieve higher operating performance—as measured by the return on assets (ROA) and net profit margin (NPM)—in the post-recession years (2010-2011).

Overall, our findings show that companies sustain their investments in intangible strategic resources (i.e., innovation and stakeholder relations) during economic downturns, suggesting that such investment strategies contribute towards the firms' ability to maintain or even strengthen their competitiveness during economic crises (and after recovery). In the following, we develop the theoretical arguments in detail, describe the methodology, present the empirical results, and conclude.

## **THEORY AND HYPOTHESES**

### **Firm resources and competitive advantage**

Management scholars have long argued that companies can sustain their competitive advantage by leveraging those resources and capabilities in which they have a comparative advantage (e.g., Helfat and Peteraf, 2003; Hooley *et al.*, 2006; Peteraf, 1993; Wernerfelt, 1984, 1995). In particular, the core tenet of the resource-based view (RBV) of the firm is that by developing valuable, rare, inimitable, and non-transferable resources and capabilities, a firm may achieve a sustainable competitive advantage and realize superior performance (Barney, 1991). Such key strategic resources, the RBV argues, comprise human capital, tangible, and intangible resources.

Moreover, existing studies argue that in rapidly changing environments, a firm's ability to continuously reconfigure and adapt its resources and capabilities to the new circumstances is essential for a firm's survival and competitiveness (e.g., Eisenhardt and Martin, 2000; Helfat *et al.*, 2007; Teece *et al.*, 1997). Importantly, Eisenhardt and Martin (2000) argue that in uncertain, dynamic, high-velocity markets, it is critical to adapt quickly, and suggest that companies with better information flow, prototyping, and experimentation, are better positioned to do so, thus improving their competitiveness. More generally, extant studies focus on firms' adaptation to relatively incremental changes in the firms' external environment or changes within single industries and markets. In contrast, very little is known of the impact of macroeconomic crises on firms' strategy; within the RBV and dynamic capabilities literature in particular, we were not able to find any article that theoretically or empirically explores the implications of an economic shock on strategic firm resources.

Yet, macroeconomic crises are fundamentally different from incremental or smaller-scale changes—even if radical—in the firm’s industry or operating context. They typically disrupt the entire economy, and hence affect firms in multiple and complex ways. During such times, the challenges of making strategic adjustments to remain competitive are likely significantly larger, while the space for strategic maneuvering is significantly smaller. In fact, recessions can lead to the “cleansing” of entire industries and the reshaping of industry boundaries (e.g., Bresnahan and Raff, 1992; Caballero and Hammour, 1994). Furthermore, the magnitude of macroeconomic crises is often unpredictable and the impact difficult to comprehend due to the complexity of the macroeconomic system and the higher uncertainty surrounding recessionary times (e.g., Bloom, 2014). As a result, firms are more likely to perceive an economic crisis as relatively more threatening than some incremental changes in their immediate operating environment.

Therefore, the current theoretical and empirical insights from the literature do not provide sufficient understanding of the way firms adapt their underlying resource base to sustain their competitive advantage during economic meltdowns (e.g., Agarwal *et al.*, 2009). In the following sections, we first describe the fundamental shock that macroeconomic crises cause to firms’ business environment, and then draw from and synthesize across different strands of literature to develop theoretical predictions about how firms can sustain their competitive advantage in times of crisis.

### **Disruptive change in the business environment**

Economic crises impact the broader macroeconomy, and importantly, they affect the entire business environment of companies, typically resulting in a disruption of existing stakeholder relationships and causing a profound shift of their competitive landscape. Specifically, higher uncertainty (Bloom, 2014), changes in regulations and policies (Baker *et al.*, 2013, Pastor and Veronesi, 2012; Rodrik, 1996), tightened access to credit (Chodorow-Reich, 2014), and increased risk of failure (Bernanke, 1981; Bhattacharjee *et al.*, 2009) are common characteristics of crisis periods. Moreover, these macroeconomic shifts affect a focal firm as much as they affect its suppliers (Cattaneo *et al.*, 2010; Levy, 1994),

consumers (Mian *et al.*, 2013), and other key stakeholders, completely disrupting and often transforming a firm's relationships with them.

Consequently, firms typically reassess and potentially adjust their strategies to sustain their competitive advantage in the long run. Pivotal to doing so is the investment in key strategic resources, namely human capital, tangible, and intangible resources (Barney, 1991). However, given the disrupting nature of major recessions, successfully sustaining a competitive advantage and stakeholder relationships raises significant short-term challenges and trade-offs. First, in periods of tightened financial budgets, firms may need to decrease investments in at least some of their resources to maintain necessary liquidity (e.g., Fazzari *et al.*, 1988). Second, precarious and/or weakening consumer demand in conjunction with changing needs and expectations by consumers, suppliers, and other stakeholders, increase overall uncertainty and hence, increase the risk of investments (e.g., Bloom *et al.*, 2007). In turn, tighter financial budgets and higher uncertainty may lead firms to focus on ensuring firm survival in the short run, rather than risk undertaking investments with a longer-term horizon. Thus, we suggest that whether and how firms adjust their investments in strategic resources ultimately hinges on their ability to address these challenges.

Our overarching argument is that firms' investments in strategic resources aim to balance the development of sustainable competitive advantage with the adaptation to short-term business disturbances. Specifically, we posit that to sustain their competitive advantage, companies will strategically maintain their investments in intangible firm resources because doing so may enable them to become more efficient and innovative, adapt more easily to the disrupted environment, and enhance organizational resilience. In other words, given the challenges that characterize economic crises, we posit that intangible firm resources—such as innovation and stakeholder relations—are likely to have important implications for a firm's ability to sustain its competitive advantage during (and beyond) times of crisis.

### **Investment strategies in times of crisis**

Recessions are marked by a sharp drop in aggregate employment; the Great Recession alone resulted in a

loss of 8.7 million jobs in the U.S. Underlying this drop in aggregate employment are firms' strategic decisions to lay off employees, postpone hiring decisions, encourage early retirements, and other measures aimed at downscaling their workforce. For example, companies can improve their organizational efficiency by reducing excess capacity—that is often the direct result of rapidly declining aggregate demand—and by restructuring departments, so as to establish leaner, more agile, and more efficient organizational structures. Moreover, to offset deteriorating revenue streams, companies are more likely to increase their cost-reducing efforts, which may translate in divesting physical assets (e.g., closing loss-making facilities) and postponing investments in new buildings and equipment. Relatedly, existing literature suggests that retrenchment may enable firms to reduce operating costs and to mitigate conditions that lead to deteriorating performance (Anand and Singh, 1997; Capron *et al.*, 2001; Tan and Peng, 2003). By releasing financial resources through retrenchment, firms are able to focus, for example, on current operations or assets in segments that are performing relatively better (e.g., Grinyer and McKiernan, 1990).

Accordingly, we posit that in times of economic meltdowns (and hence financial scarcity) companies are likely to decrease their investments in human capital and tangible resources, since the released financial and cognitive managerial resources may be utilized more effectively in the short run. In contrast, we argue that maintaining investments in intangible strategic resources becomes particularly salient for sustaining a competitive advantage during turbulent economic times as they can help companies i) become more efficient and innovative, ii) adapt more easily to shifting needs, demands, and expectations of suppliers, consumers, and other stakeholders, and iii) enhance organizational resilience. In the following, we provide supporting arguments for each of these three dimensions.

#### *Efficiency and innovativeness*

During economic downturns, finding ways to achieve more with less and to maintain or even increase firm value without jeopardizing firm survival is vital. We thus argue that investments in intangible resources are of particular appeal as they can help companies become more efficient and more innovative

in a number of ways. First, by maintaining (or perhaps even improving) their innovation processes, companies are more likely to discover novel ways to become leaner and more efficient. This view is consistent with Schumpeter's theory of "creative destruction" whereby a major economic crisis generates opportunities that can be exploited through reorganization and up-skilling of R&D activities. According to this theory, recessions shift firms' attention towards addressing organizational inefficiencies, thus encouraging reorganization and innovation (Schumpeter, 1939).<sup>2</sup> A survey conducted by Booz & Company (2009) supports this argument—during the Great Recession, virtually all surveyed companies enhanced their innovation processes to align product development with the changing economic reality and increase the return on their R&D investments. Specifically, several companies—including, e.g., Pitney Bowes and Harman International—intensified communication and collaboration between research labs and development shops to save costs and, at the same time, deliver products and solutions to customers more effectively.

Second, by continuing their investments in experimentation and exploring new collaborative practices with their stakeholders, companies may improve their technological and innovative capability. For example, Pitney Bowes adopted a new idea-generating process, called IdeaNet, during the recession. This process provides an electronic meeting platform for its 35,000 employees to collaborate and provide comments and inputs on any idea that they think helps create new sources of revenue, improve profitability, or add value for customers. Within two years of including the entire workforce in innovative thinking, the company was able to realize \$8 million in revenues from employee-driven innovations (Dahl, 2011). Pitney Bowes is not the only company that views stakeholder engagement as an important determinant of the firm's ability to innovate and generate profits. In fact, many companies—e.g., Audi, General Electric, IBM, Nike—include consumers, employees, suppliers, governments, and other stakeholders in their innovation process (Bogers *et al.*, 2010; Chatterji and Fabrizio, 2014; *Computer Weekly News*, 2013; Fueller *et al.*, 2008; *New York Times*, 2012; von Hippel, 1976, 1978). More broadly,

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<sup>2</sup> See also the related literature that studies the sensitivity of innovation to industry output or sales growth (e.g., Aghion *et al.*, 2012; Fabrizio and Tsolmon, 2014).

stronger stakeholder relations help spark innovation (Flammer and Kacperczyk, 2015), and we further suggest that they may also improve overall firm efficiency especially in times of crisis through, for instance, improved employee motivation and decreased risk of supplier disruptions.

In sum, we argue that investments in intangible strategic resources in the form of innovation and stakeholder relations are likely to help improve (or at least maintain) firms' innovative positioning and strengthen firms' competitiveness during economic crises (and after recovery).

#### *Adaptation to shifting needs, demands, and expectations*

In times of unpredictable and profound economic shocks it is particularly difficult for companies to adapt. Yet, understanding and adjusting to the changing environment is likely to be an important driver of firm performance and survival during such times. Hence, the ability to spot concerns and opportunities in a timely manner and to adapt to the shifting needs of the firm's stakeholders lies at the core of sustaining competitiveness. In the following, we argue that firms that maintain their investments in stakeholder relationships and innovative capabilities are better able to do so.

In particular, we argue that strategic investments that help strengthen stakeholder relationships are likely to improve a firm's ability to acquire valuable information and therefore to rapidly understand changing stakeholder needs, demands, and expectations. Also, by engaging with their stakeholders, companies can more proactively shape public policies to their advantage (Werner, 2015) and reduce the uncertainty in their external (e.g., regulatory, technological) business environment (McGrath, 1997) compared to firms with weaker stakeholder engagement. Moreover, a firm's ability to adapt quickly to the changing environment can be enhanced by experimenting and exploring new methods and processes (e.g., Eisenhardt and Martin, 2000). For example, having stronger innovation capability may allow a firm to change product attributes more rapidly than its competitors. Finally, firms that invest in innovation *and* stakeholder relationships may be better positioned to undertake necessary internal adaptive changes and to tolerate more risky experimentation precisely because they enjoy superior trust by their stakeholders and thus, a wider margin for strategic maneuvering compared to other firms.

In line with our theoretical prediction, a wide spectrum of companies—including, e.g., Applied Materials, General Motors, and Kraft Foods—shifted their focus away from product development during the crisis towards more effective delivery of products and solutions to their customers. Kraft Foods, for example, launched price-sensitive products to deal with the drop in consumers' purchasing power. More generally, the aforementioned survey indicates that 70% of the surveyed companies adjusted their investment strategies to better capture changing customer requirements (Booz & Company, 2009). Relatedly, many companies intensified their collaboration with suppliers to address their needs and optimize production processes. For example, Starbucks increased its commitment to subsistence coffee farmers in developing countries, offering them training and fair prices for sustainable coffee production, thereby ensuring quality and supply of ethically sourced coffee for Starbucks (Starbucks, 2009).

In sum, we suggest that investments in intangible strategic resources in the form of innovation and stakeholder relations may allow companies to better understand and more quickly act upon shifting needs and demands within their value chains and across their stakeholders.

### *Organizational resilience*

By maintaining their investments in intangible strategic resources, companies may strengthen their organizational resilience during times of crisis. In particular, we argue that such investments may enable companies to buffer major disturbances in the business environment, recover from them more quickly, and hence sustain their competitiveness.

First, sustaining investments in innovation during a major recession—a time of acute liquidity constraints and high resource allocation trade-offs—may send a strong signal to constituencies about the centrality of innovation capability for the firm's competitive advantage and a credible signal of commitment towards maintaining it. We suggest that especially in a time of heightened uncertainty, firms are more likely to seek to send such credible signals to their stakeholders in general and to capital markets and their customers in particular.

Second, by maintaining investments in stakeholder relationships, firms may benefit from

improved access to finance as enhanced stakeholder engagement and transparency help decrease agency costs and information asymmetry (Cheng *et al.*, 2014). Also, strong relationships with stakeholders can mitigate companies' risk of social activism and regulatory action (e.g., Baron and Diermeier, 2007; Maxwell *et al.*, 2000). Arguably, during times of economic meltdowns characterized by financial scarcity, the ability to alleviate risks of capital constraints, social activism (e.g., due to elevated social frustration and disappointment towards the business community), and regulatory actions helps improve organizational resilience, which in turn contributes to firm survival and competitiveness.

In addition, investments in stakeholder relations can improve firm performance (e.g., Eccles *et al.*, 2014; Flammer, 2015b; Hillman and Keim, 2001; Russo and Fouts, 1997), help firms differentiate themselves from their competitors (e.g., Bettinazzi, *et al.* 2015; Flammer, 2015a), and enhance firms' ability to recover from unfavorable situations and turbulent times (e.g., Bansal *et al.*, 2015; Barnett *et al.*, 2015; Choi and Wang, 2009; DesJardines *et al.*, 2015; Lins *et al.*, 2015). More specifically, firms with stronger relationships with their suppliers and other constituencies can benefit from lower price elasticity of demand and higher consumer loyalty (e.g., Du *et al.*, 2007; Kotler *et al.*, 2012).<sup>3</sup> Moreover, by showing commitment to their stakeholders during rough times, companies may improve their reputation, brand, legitimacy and trustworthiness (e.g., Du *et al.*, 2011; Du and Vieira, 2012; Elfenbein *et al.*, 2012; Hart, 1995; Lev *et al.*, 2010; Palazzo and Scherer, 2006), all of which likely enhance their ability to operate and further strengthen customer loyalty. Also, companies with stronger stakeholder relationships may benefit from attracting, motivating, and retaining talented employees (e.g., Burbano, 2015; Carnahan *et al.*, 2015; Flammer and Luo, 2015; Turban and Greening, 1996). Arguably, being an employer of choice is particularly valuable in times of crisis, when maintaining innovative productivity and efficiency is of foremost importance for survival and competitiveness.

Lastly, we suggest that maintaining investments in stakeholder relationships may result in better-informed and superior decision-making in turbulent times: well-maintained relationships can provide

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<sup>3</sup> For example, despite the drop in consumers' purchasing power during the Great Recession, sales of, e.g., fair trade products such as bananas, chocolate, and coffee increased substantially (CBC News, 2009; *The Guardian*, 2011).

access to and facilitate the integration of diverse sources of information (e.g., from suppliers, customers, or local communities). In turn, this may enable companies to better assess the changes in the business environment, undertake the necessary strategic adjustments, and maneuver through the crisis.

Overall, we theorize that firms sustaining their investments in intangible strategic resources are better able to adapt to major disturbances in the business environment and hence sustain their competitiveness during (and beyond) recessionary times. Consequently, we predict that companies react to macroeconomic meltdowns by strategically maintaining their investments in intangible resources. In contrast, we posit that firms are likely to reduce their investments in human and tangible capital to maintain liquidity and reduce costs.

*Hypothesis 1a. During recessions, companies maintain their investments in intangible resources such as i) innovation, and ii) stakeholder relationships.*

*Hypothesis 1b. During recessions, companies decrease their investments in i) human capital and ii) physical capital (i.e., tangible resources).*

Naturally, an alternative hypothesis may be that companies prefer to decrease investments in intangible resources rather than investments in human capital and tangible resources. For example, it could be that the latter are more crucial for sustaining competitiveness in times of economic crisis. Or it could be that companies understand the strategic value of R&D and CSR during recessions, but fail to take appropriate actions—due to, e.g., organizational inertia, internal political constraints, individuals' status quo bias, or limited information (e.g., Hannan and Freeman, 1977; Samuelson and Zeckhauser, 1988).<sup>4</sup>

### **Industry-specific investment strategies**

Building on the insight that firms are able to sustain the value of their strategic resources only when, over time, they regularly reconfigure their resource base (e.g., Amit and Shoemaker, 1993; Capron *et al.*, 1998;

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<sup>4</sup> Similarly, and in the spirit of bounded rationality theories (e.g., Kahneman, 2003; March, 1991; Simon, 1955, 1956), it may be cognitively difficult for managers to comprehend the implications of cutting or increasing investments in strategic resources—all of which have benefits and costs for the firm—during an economic crisis, leading to inferior decision-making.

Dierickx and Cool, 1989), some scholars have argued that core resources or capabilities often become specialized to the firm's particular operating context (e.g., Barnett *et al.*, 2015; Barney *et al.*, 2010; Brush and Artz, 1999; Priem and Butler, 2001). Thus, we expect that the strategic value of firm resources varies across industries.

In times of economic crisis, firms are likely to face tighter financial budgets and, as a result, may have to significantly cut investments in some strategic resources to maintain cash flow and ensure firm survival. Thus, we argue that companies are more likely to strategically focus their investments on those resources that are core to their specific operating context, and hence to sustaining their competitive advantage. In particular, firms' innovative capabilities are likely to be more important in R&D-intensive industries, in which innovation plays a focal role. Conversely, in industries with low R&D intensity, firms' competitiveness is less likely to depend on their innovative capabilities and therefore companies may be more inclined to cut R&D budgets during recessions. This motivates the following hypothesis:

*Hypothesis 2a. During recessions, companies in industries with low R&D intensity decrease their investments in innovation.*

Similarly, the strategic value of investments in stakeholder relations is likely to be lower in industries with low CSR-sensitivity—i.e., industries where stakeholder support plays a marginal role for firms' competitiveness and survival. Hence, in such industries, companies may reduce their stakeholder engagement in times of crisis. This motivates the following hypothesis:

*Hypothesis 2b. During recessions, companies in industries with low CSR sensitivity decrease their investments in stakeholder relations.*

### **Long-term strategies and firm performance**

The previous arguments imply that, by maintaining their investments in intangible firm resources during recessionary times, companies can sustain their competitive advantage. Specifically, we argued that innovation and stakeholder relations may help companies become i) more efficient and innovative, ii) more adaptable, and iii) more resilient. Therefore, we expect companies that sustained their investments

in these resources to perform better once the economy recovers compared to companies that did not. This leads to the following hypothesis:

*Hypothesis 3. In the post-recession years, companies that sustained their investments in intangible resources—such as i) innovation and ii) stakeholder relationships—during the recession perform better than companies that decreased investments in intangible resources.*

## DATA AND METHODOLOGY

### Data sources and variable definitions

#### *Dependent variables*

Our main data source is Standard & Poor's Compustat. Compustat contains 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.

***Human capital.*** We measure the size of the company's workforce annually by taking the natural logarithm of the number of employees from Compustat.

***Tangible resources.*** To measure annual investments in physical capital, we compute the ratio of capital expenditures (CAPEX) to property, plant & equipment (PPE). Also, to mitigate the impact of outliers, we winsorize this ratio at the 1<sup>st</sup> and 99<sup>th</sup> percentiles of its distribution.

***Intangible resources.*** We measure annual investments in innovation by computing the ratio of R&D expenses to total assets. We winsorize this ratio at the 1<sup>st</sup> and 99<sup>th</sup> percentiles of its distribution.

To measure investments in stakeholder relations, we use the KLD-index. This index is obtained from the Kinder, Lydenberg, and Domini (KLD) database and is widely used in CSR studies (e.g., Chatterji and Toffel, 2010; Flammer, 2015a; Ioannou and Serafeim, 2015). 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).<sup>5</sup>

***Changes during the Great Recession.*** In the empirical analysis, we examine how companies adjust the four different types of capital during the Great Recession. Accordingly, we compute the change in these variables from 2007-2009, which we denote by  $\Delta \log(\text{employees})$ ,  $\Delta \text{CAPEX/PPE}$ ,  $\Delta \text{R\&D/Assets}$ , and  $\Delta \text{KLD-index}$ , respectively.<sup>6</sup>

### *House price shocks*

The house price data are obtained from Zillow (<http://www.zillow.com/research/data/>). Zillow provides estimates of the price of more than 110 million individual houses in the U.S. These estimates combine information from various sources, including prior sales, county records, tax assessments, real estate listings, and mortgage information. Zillow aggregates these house-level valuations into an index—the Zillow House Value Index (ZHVI). The ZHVI is available at monthly frequency for various geographical units (i.e., ZIP code, county, Metropolitan Statistical Area, and state). We measure the severity of the house price drop (henceforth *house price shock*) by computing the percentage decrease in ZHVI from December 2006 until December 2009 in the company’s Metropolitan Statistical Area (MSA), and find that, on average, the ZHVI dropped by 14.9%.<sup>7,8</sup> Our timing convention is consistent with prior studies of the Great Recession (e.g., Giroud and Mueller, 2015; Mian and Sufi, 2014). Nonetheless, we have verified that we obtain similar results throughout if we compute house price changes from March 2007

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<sup>5</sup> In 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., Johnson-Cramer, 2004; Mattingly and Berman, 2006). Nevertheless, in robustness checks we show that we obtain similar results if we use the net KLD-index.

<sup>6</sup> For example,  $\Delta \log(\text{employees}) = \log(\text{employees}_{2009}) - \log(\text{employees}_{2007})$ .

<sup>7</sup> As defined by the Office of Management and Budget, an MSA consists of a core area that contains a substantial population nucleus together with adjacent communities that have a high degree of social and economic integration with that core. For example, the Boston MSA comprises 4.5 million inhabitants in multiple counties. Since MSAs represent “economic areas,” they are ideally suited to approximate the company’s primary market.

<sup>8</sup> In robustness checks, we show that we obtain similar results if we i) consider house price shocks in the company’s state, ii) restrict the sample to geographically concentrated companies, and iii) restrict the sample to the non-tradable sector.

(when house prices peaked) to May 2009 (when house prices bottomed out).

### *Control variables*

In our baseline specification, we control for numerous firm characteristics measured in 2007 (i.e., at the beginning of the Great Recession), all of which are obtained from Compustat. *Size* is the natural logarithm of the book value of total assets. *Return on 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 1<sup>st</sup> and 99<sup>th</sup> percentiles of their distribution. These covariates capture differences in firm size (*Size*), profitability (*ROA*), investment opportunities (*Tobin's Q*), and financing (*Leverage*, *Cash holdings*), which may affect subsequent strategic investments.

### *Sample selection*

Our sample consists of all Compustat companies that are located in the U.S. and have non-missing values for  $\Delta \log(\text{employees})$ ,  $\Delta \text{CAPEX/PPE}$ , *house price shock*, and the control variables. These criteria leave us with a final sample of 3,538 companies. Since R&D is missing for several observations, the sample for which we can compute  $\Delta R\&D/Assets$  is smaller (1,785 companies). Similarly, KLD data are only available for a subset of Compustat firms. Consequently, the sample for which we can compute  $\Delta KLD\text{-index}$  is smaller as well (1,890 companies).<sup>9</sup>

Panel A of Table 1 provides summary statistics for all the variables described in this section (the variable *housing supply elasticity* in the last row is described in the methodology section).

-----Insert Table 1 about here-----

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<sup>9</sup> In robustness checks, we show that we obtain similar results if we restrict our sample to the common sample in which both  $\Delta R\&D/Assets$  and  $\Delta KLD\text{-index}$  can be computed.

## Methodology

### *Ordinary least squares (OLS) regressions*

To examine how companies adjust their strategic investments during the Great Recession, we exploit regional differences in the house price collapse. Regions in which the house price collapse was more severe experienced a larger drop in consumption (Mian *et al.*, 2013), and ultimately a larger drop in employment (Mian and Sufi, 2014). Accordingly, regional differences in the house price collapse provide cross-sectional variation in the severity of the Great Recession.

We estimate companies' responses to the house price collapse (*house price shock*) by estimating the following regression:

$$\Delta y_{ism} = \alpha_s + \beta \times \text{house price shock}_m + \gamma' \mathbf{X}_{ism} + \varepsilon_{ism}, \quad (1)$$

where  $i$  indexes firms,  $s$  indexes industries (2-digit SIC major groups), and  $m$  indexes Metropolitan Statistical Areas (MSA);  $\alpha_s$  are industry fixed effects;  $\Delta y$  is the change in the variable of interest—i.e., *log(employees)*, *CAPEX/PPE*, *R&D/Assets*, *KLD-index*—from 2007-2009; *house price shock* is the percentage drop in the Zillow Home Value Index (ZHVI) from 2006-2009 in the company's MSA;  $\mathbf{X}$  is the vector of control variables, which includes *size*, *cash holdings*, *leverage*, *ROA*, and *Tobin's Q* (all measured in 2007);  $\varepsilon$  is the error term.<sup>10</sup> Throughout the analysis, we cluster standard errors at the state level. (The results are similar if standard errors are clustered at the firm or industry level.)

This approach is similar in spirit to a difference-in-differences setup, where we compare  $\Delta y$ —i.e., how companies adjust their strategic investments during the Great Recession—for companies in more affected regions (“treatment group”) with companies in less affected regions (“control group”).

### *Two-stage least squares (2SLS) regressions*

A potential concern with equation (1) is that changes in house prices may be endogenous with respect to  $\Delta y$ —e.g., companies' actions may affect real estate prices. To address this concern, we use an

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<sup>10</sup> Equation (1) mirrors the specification used by Mian and Sufi (2014) who study the effect of house price shocks on employment growth at the county level.

instrumental variable (IV) approach. Specifically, we instrument changes in house prices with Saiz’ (2010) topological measure of housing supply elasticity at the MSA level. This measure captures housing supply constraints that are driven by the topology of an area (e.g., steep hills or water areas). Intuitively, if *quantities* are difficult to adjust due to topological constraints, one would expect *prices* to be more sensitive. Accordingly, we expect Saiz’ (2010) topological measure to be a strong predictor of the drop in house prices during the crisis (inclusion restriction). Moreover, an appealing feature of this measure is that the topology of an area is unlikely to be systematically related to companies’ strategic investments (exclusion restriction). For these reasons, Saiz’ (2010) topological measure is widely used as an instrument for house price changes in the literature on the Great Recession (e.g., Giroud and Mueller, 2015; Mian and Sufi, 2009, 2011, 2014; Mian *et al.* 2013).<sup>11</sup>

In the first stage, we regress the drop in house prices on the housing supply elasticity. The predicted values from this regression provide the “instrumented” house price shock—i.e., the exogenous component of the house price shock. In the second stage, we then re-estimate equation (1) using *house price shock (instr.)* in lieu of *house price shock*:

$$\Delta y_{ism} = \alpha_s + \beta \times \text{house price shock (instr.)}_m + \gamma' \mathbf{X}_{ism} + \varepsilon_{ism}. \quad (2)$$

The coefficient of interest is  $\beta$ , which measures the effect of house price shocks on firms’ strategic investments during the Great Recession.

### *Geographical considerations*

House price shocks are measured in the MSA of the company’s headquarters. The underlying assumption is that a significant portion of the company’s business is conducted in that MSA. This assumption may

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<sup>11</sup> The economics literature uses the Saiz measure to instrument changes in house prices in two settings: i) when house prices increased during the run-up of 2002-2006, and ii) when house prices fell during the recession of 2007-2009. Strictly speaking, the intuition provided above applies to the run-up period. Indeed, as the economy is booming, the demand for housing increases, which leads to higher house prices in regions where housing supply is inelastic. A key feature of the Great Recession, however, is the symmetry in the house price movements—regions that experienced a higher increase during the run-up also experienced a larger drop during the bust. Hence, to the extent that the Saiz instrument has explanatory power for changes in house prices during the run-up, it also has explanatory power for changes in house prices changes during the Great Recession. Our paper exploits the latter feature of the instrument (for a similar application see, e.g., Giroud and Mueller, 2015; Mian and Sufi, 2014).

not always be reasonable, especially for companies with a broader consumer base. We address this issue in several ways, which we discuss below.

***MSA versus state.*** First, the company’s MSA may be too narrow of a market if companies have state-wide operations. In robustness checks, we show that we obtain similar results if we use house price shocks at the state level instead of the MSA level (using Zillow’s state-level index).

***Geographically dispersed companies.*** More importantly, firms may have significant operations in multiple states. To address this issue, we use the data of Garcia and Norli (2012) on state-level operations of companies based on their 10-K filings. Specifically, we identify a subset of “geographically concentrated firms,” i.e., firms with at least 80% of their operations in their home state. We then show that our results are robust if we restrict the sample to these companies.

***Tradable versus non-tradable sectors.*** Mian and Sufi (2014) distinguish between the “tradable” and “non-tradable” sectors. In the tradable sector (e.g., manufacturing), the demand for the company’s product is nationwide. In contrast, in the non-tradable sector (e.g., retail), demand is mostly local. Accordingly, regional demand shocks—such as those induced by house price shocks—are less likely to be relevant in the tradable sector. In robustness checks, we show that our results are also robust to excluding the tradable sector.

## RESULTS

### Main results

#### *Descriptive analysis*

As a starting point, we conduct a descriptive analysis of companies’ strategic investments during the Great Recession. Panel B of Table 1 provides means and medians of the four dependent variables (along with their standard errors). As can be seen, companies reduced employment by about 3.8% and capital expenditures (as a ratio of PPE) by 3.1% from 2007-2009. Both reductions are highly significant.

In contrast, companies sustained the same level of investments in R&D and CSR—there is no significant change in R&D spending or the KLD-index. If at all, the KLD-index increased slightly during

the Great Recession (albeit not significantly).

While this evidence is suggestive of Hypotheses 1a and 1b, it needs to be interpreted with caution. Indeed, we do not know the counterfactual—i.e., how companies would have acted absent the Great Recession. In the following, we approximate this counterfactual by exploiting cross-sectional variation in the severity of the Great Recession.

### *OLS regressions*

Table 2 reports estimates from the OLS regression specified in equation (1)—i.e., a regression of the four dependent variables (which all capture *changes* in firm resources) on the drop in house prices during the crisis. As can be seen, the results mirror those of the descriptive analysis.

-----Insert Table 2 about here-----

In column (1), we find that companies located in regions that are more severely affected by the house price collapse lay off more employees. The coefficient of -0.099 implies that a one-standard deviation decrease in house prices (12.2%, see Table 1) is associated with a decrease in employment by  $0.099 \times 0.122 = 1.2\%$ . This finding is consistent with previous work (Giroud and Mueller, 2015; Mian and Sufi, 2014) documenting that house price shocks led to a drop in employment.<sup>12</sup>

In column (2), we observe a similar pattern for physical investment. Specifically, we find that companies significantly reduced their capital expenditures. The coefficient of -0.104 implies that a one-standard deviation decrease in house prices corresponds to a decrease in capital expenditures by  $0.104 \times 0.122 = 1.3\%$  of PPE. This finding indicates that human and physical capitals were adjusted in a similar fashion during the crisis.

In contrast, in columns (3) and (4), we find virtually no change in R&D spending and CSR investments. Both coefficients are insignificant and small in economic terms. These no-results are what

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<sup>12</sup> The coefficients of the controls have intuitive signs: large and profitable firms are better able to go through the recession without laying off employees. The same applies to firms with good investment opportunities (high Tobin's Q). Conversely, high-leverage firms—i.e., firms that are more likely to be financially constrained—lay off more employees. The latter is consistent with Giroud and Mueller's (2015) findings.

we figuratively refer to as the “dog that didn’t bark”—precisely, the interesting finding of our study is that companies did *not* decrease investments in intangible resources such as innovation and stakeholder relations, despite cutting significantly investments in human and physical capital. These findings are supportive of Hypotheses 1a and 1b, according to which companies sustain their intangible investments in times of crisis.

### *2SLS regressions*

As discussed above, a potential caveat of the previous analysis is that changes in house prices may be endogenous with respect to changes in companies’ strategic investments. To address this concern, we use Saiz’ (2010) housing supply elasticity as an instrument for changes in house prices. The results of the 2SLS analysis are presented in Table 3.

-----Insert Table 3 about here-----

In column (1), we estimate the first-stage regression.<sup>13</sup> As is shown, the housing supply elasticity is a strong predictor of the drop in house prices and, as expected, the drop in house prices is mitigated for regions with higher elasticity of housing supply—i.e., regions whose topological features are less constraining. The housing supply elasticity qualifies as a “strong” instrument. Indeed, the *F*-statistic of the instrument is 34.03, which exceeds the rule of thumb for strong instruments ( $F \geq 10$ ) proposed by Staiger and Stock (1997) as well as the 10% critical threshold value of Stock and Yogo (2005, p. 101).

In columns (2)-(5), we then estimate the second-stage regression specified in equation (2). As can be seen, the results are very similar to those in Table 2. In particular, companies respond to house price shocks by significantly reducing employment and capital expenditures, yet they do not reduce R&D spending and CSR investments.

### **Robustness**

We estimate several variants of the 2SLS regressions presented in Table 3 (henceforth “baseline

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<sup>13</sup> We note that the number of observations decreases from 3,538 to 3,120 firms since Saiz’ (2010) measure is not available for all MSAs.

regressions”). The results are provided in Appendix Table 1.

***State-level house price shocks.*** The company’s MSA may be too narrow of a market if companies have state-wide operations. In Panel A, we re-estimate our baseline regressions using state-level house price shocks in lieu of MSA-level house price shocks. As can be seen, the results are very similar to the findings in Table 3.

***Geographically concentrated firms.*** Firms may have significant operations in multiple states. To address this issue, we use the data of Garcia and Norli (2012) on state-level operations of public companies. Specifically, we identify a subset of so-called “geographically concentrated firms,” i.e., firms with at least 80% of their operations in their home state. In Panel B, we re-estimate our baseline regressions in this subsample. As is shown, the effect of house price shocks on employment and capital expenditures is larger than in Table 3. This is not surprising given the closer congruence between the shock and the location of the firm’s operations. Importantly, even in this subsample, the effect on R&D spending and the KLD-index remains small and insignificant.

***Excluding the tradable sector.*** Relatedly, in the “tradable” sector (e.g., manufacturing), the demand for the firm’s products is nationwide or global. Accordingly, in these industries, companies should be less sensitive to regional demand shocks such as those induced by house price shocks. To identify companies operating in the tradable sector, we use the classification of Mian and Sufi (2014) based on 4-digit NAICS codes. We then re-estimate our baseline regressions excluding the tradable sector. The results are presented in Panel C. As can be seen, the effect on employment and capital is larger than before. Nevertheless, the effect on R&D and the KLD-index is again small and insignificant.

***Pre-crisis levels and pre-trends.*** Another potential concern is that firms may reduce their workforce and physical capital during the Great Recession because they have expanded too much prior to the crisis. To address this point, we re-estimate our baseline regressions controlling for the 2007 level along with the 2002-2007 change (i.e., the “pre-trend”) in the dependent variable—e.g., in the first column, we include as controls  $\log(\text{employees})_{2007}$  and  $\Delta \log(\text{employees})_{2002-2007}$ . As is shown in Panel D, our results are robust to this inclusion.

**Common sample.** In our baseline regressions, the analysis of R&D spending and the KLD-index is based on a smaller number of observations (due to missing values of R&D in Compustat and the less comprehensive coverage of the KLD database). Accordingly, one potential concern is that companies with non-missing R&D and KLD data may systematically differ from the average firm in our sample. If these companies did not reduce employment and capital expenditures during the crisis (e.g., because they are perhaps more robust or less cyclical), then our results might be driven by selection. To address this concern, we re-estimate our baseline regressions in the subsample for which none of the dependent variables is missing. The results are provided in Panel E. As is shown, we find that these companies reduced employment and capital expenditures to a similar extent compared to the average company in our sample while, once again, the effect on R&D and the KLD-index is small and insignificant.

**Alternative dependent variables.** In our baseline analysis, capital expenditures and R&D expenses are scaled by PPE and assets, respectively. While such normalization is common practice in the literature, one potential concern is that the results may be affected by changes in the scaling variable. Moreover,  $\Delta$  KLD-index is specified as an index change as opposed to a percentage change. In the first three columns of Panel F, we consider alternative dependent variables that address these issues:  $\Delta \log(1 + CAPEX)$ ,  $\Delta \log(1 + R\&D)$ , and  $\Delta \log(1 + KLD\text{-index})$ , which represent the growth in CAPEX, R&D expenses, and the KLD-index, respectively. Note that we add one to each variable to account for observations with a zero value of the respective variable. As is shown, the results based on these alternative dependent variables mirror those obtained in our baseline specification. Finally, in the last column of Panel F, we replace the KLD-index by the “net” KLD-index (i.e., the number of KLD strengths minus the number of KLD concerns). Again, we obtain similar results.

## **Cross-sectional heterogeneity**

### *R&D-intensive industries*

The evidence provided so far indicates that companies maintained their investments in innovation and stakeholder relations during the Great Recession. That being said, firms’ responses may differ across

industries. In particular, in less R&D-intensive industries, firms' competitiveness is less dependent on their innovative capabilities. Accordingly, we suggest that in such industries, companies may be more inclined to cut R&D budgets during the crisis.

To examine whether this is the case, we construct a measure of R&D intensity at the industry level. Specifically, we compute the ratio of R&D expenses to total assets for all Compustat firms in 2007. We then compute the average across all firms in any given 2-digit SIC industry ("R&D intensity"). In column (1) of Table 4, we re-estimate our baseline R&D regression, interacting *house price shock* with a dummy variable indicating whether *R&D intensity* is below the first quartile across all industries. Consistent with Hypothesis 2a, we find that companies in less R&D intensive industries did cut significantly on R&D following house price shocks.

-----Insert Table 4 about here-----

#### *CSR-sensitive industries*

Similarly, the strategic value of stakeholder relations is likely lower in industries that are less CSR-sensitive. In analogy to the analysis of R&D intensity, we construct a measure of "CSR sensitivity" by computing the average KLD-index across all firms in any given 2-digit SIC industry in 2007. In column (2) of Table 4, we then re-estimate our baseline CSR regression, interacting *house price shock* with a dummy variable indicating whether *CSR sensitivity* is below the first quartile across all industries. In support of Hypothesis 2b, we find that indeed firms in less CSR-sensitive industries significantly decreased their CSR investments following house price shocks.<sup>14</sup>

Finally, we note that the findings presented in Table 4 also help rule out the possibility that companies maintain their R&D and CSR for reasons unrelated to competitiveness, e.g., because they may be "sticky" and hence difficult to reduce in the short run. To further address this point, we examine whether companies' continued investment in intangible resources is moderated by the degree of financing constraints. In times of economic crisis, financially constrained firms may perceive the value of sustaining

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<sup>14</sup> The results in Table 4 are stronger if we consider the bottom decile in lieu of the bottom quartile. In the R&D (CSR) regression, the coefficient of the interaction term increases to -0.026 (-0.866).

investments in intangible resources, yet they may nevertheless have to reduce such investments to address short-term concerns of firm survival. In columns (3) and (4) of Table 4, we re-estimate the baseline specifications for R&D, and CSR respectively, interacting *house price shock* with a dummy variable indicating whether the *KZ-index* of Kaplan and Zingales (1997) is above the third quartile across all firms.<sup>15</sup> As can be seen, financially constrained firms indeed decreased their investments in R&D and CSR following house price shocks.

### **Firm performance**

In this section, we examine whether companies that sustained their investments in innovation and stakeholder relations during the Great Recession perform better once the economy recovers—to the extent that these strategies are value-enhancing, as we argue in the theory section, companies that held on to them in bad times may benefit in the upturn.

To examine the performance implications, we regress post-recession performance—i.e., the average return on assets (ROA) in 2010-2011—on a dummy variable that indicates whether the company *did not* reduce R&D (and CSR, respectively) during the Great Recession, industry fixed effects, and controls.<sup>16</sup> For robustness, we also consider net profit margin (NPM) as an alternative performance measure. NPM is defined as the ratio of operating income before depreciation to sales from Compustat. To mitigate the impact of outliers, both ROA and NPM are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles of their distribution.

The results are presented in Table 5. As can be seen, companies that did not reduce their R&D spending (columns (1)-(2)), nor their CSR investments (columns (3)-(4)), achieved higher performance in the post-recession years compared to companies that did cut investments in R&D and CSR, respectively. The performance implications are also economically significant: the reported coefficient of 0.020 for

<sup>15</sup> The KZ-index index is a linear combination of several Compustat items that capture the difficulty of raising resources to finance new projects. The computation of the KZ-index is described in Lamont, Polk, and Saa-Requejo (2001, pp. 551-552).

<sup>16</sup> More precisely, we estimate the following regression:  $ROA_{is} = \alpha_s + \beta \times dummy_{is} + \gamma' \mathbf{X}_{is} + \varepsilon_{is}$ , where  $ROA$  is the average return on assets of company  $i$  in the years 2010-2011;  $dummy$  is an indicator variable that is equal to one if the company did not reduce R&D (and CSR, respectively) from 2007-2009;  $\alpha_s$  are industry fixed effects; the control variables in  $\mathbf{X}$  are the same as in regression (1).

R&D (0.005 for CSR) corresponds to a 34% (9%) higher ROA for companies that did not reduce their investments in R&D (CSR) compared to those companies that did. Furthermore, in columns (5)-(6), we find that the post-recession performance is even higher for companies that reduced *neither* R&D nor the KLD-index. These results lend support to Hypothesis 3. Overall, this evidence indicates that intangible firm resources such as innovation and stakeholder relations are instrumental in sustaining a competitive advantage during (and beyond) times of crisis.<sup>17</sup>

-----Insert Table 5 about here-----

## DISCUSSION AND CONCLUSION

How did companies adjust their investments in key strategic resources during the Great Recession of 2007-2009? We argue that sustaining investments in intangible strategic resources—such as innovation and stakeholder relationships—during recessionary times is instrumental in maintaining, or even enhancing, firms' competitiveness. Specifically, we theoretically argue that a strategic focus on these resources can help companies sustain their competitive advantage by enabling them to i) become more efficient and innovative, ii) adapt more easily to shifting needs and demands of suppliers, consumers, and other stakeholders, and iii) enhance organizational resilience. Accordingly, we expect companies to strategically maintain their investments in intangible resources during economic crises. In contrast, we expect them to reduce their investments in human capital and tangible resources to maintain liquidity and reduce costs.

To examine this question empirically, we exploit a unique feature of the Great Recession: the role played by the house price collapse—regions that experienced a larger drop in house prices were more severely hit by the crisis (e.g., Mian and Sufi, 2011, 2014; Mian *et al.*, 2013). Using this cross-sectional variation in the severity of the crisis, we study how firms that are more severely affected (i.e., firms located in regions that experience a larger drop in house prices) adjust their strategic investments

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<sup>17</sup> We caution that the results in Table 5 do not necessarily warrant a causal interpretation. Indeed, while our empirical setting allows us to study the causal impact of house price shocks on 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.

compared to firms that are less affected. To obtain exogenous variation in the house price drop, we use as instrumental variable (IV) Saiz' (2010) topological measure of housing supply elasticity. Intuitively, if the topology of the region (e.g., steep hills or rocky terrain) makes it difficult to adjust quantities, prices will be more sensitive. Importantly, the region's topological features are unlikely to be systematically related to firms' strategic investments—that is, the exclusion restriction is likely fulfilled. Using this methodology, we find that companies significantly reduced their workforce and capital expenditures during the Great Recession. In contrast, and this is the key finding of our study, they sustained their investments in R&D and CSR, suggesting that such investment strategies contribute towards the firms' ability to maintain their competitiveness during (and post) recessionary times.

In auxiliary analyses, we further document that—although on average firms did not decrease their investments in R&D and CSR—firms operating in industries with low R&D intensity and low CSR sensitivity, respectively, were more likely to do so. This finding offers additional verification for the mechanisms we argue for in this study. Indeed, it indicates that companies cut their R&D and CSR budgets only if they operate in industries where innovation and stakeholder relations are inessential to the firm's competitiveness.

Finally, we find that companies that sustained their investments in R&D and CSR performed better in the post-recession years (2010-2011), in line with the argument that such investment strategies contribute to the companies' competitive advantage in the long-run.

Our study contributes to the literature in at least four ways. First, while the adaptation to external changes has long been studied in strategic management research, the focus to date has been on relatively incremental changes or changes within a specific industry (e.g., Christensen, 1997; Eisenhardt and Martin, 2000; Helfat *et al.*, 2007; Meyer, 1982; Teece *et al.*, 1997). In contrast, little is known of firm strategy in times of major economic crises such as the Great Recession. Our paper tries to fill this void in the literature by studying theoretically and empirically the implications of a major economic crisis for strategic firm resources.

Second, our paper contributes to the literature that studies the benefits of intangible firm resources. Prior research highlights the role of innovation and stakeholder relations as a source of value creation (e.g., Edmans, 2011, 2012; Flammer, 2015b; Hall *et al.*, 2005). In this paper, we document an important channel through which intangible resources create value—they contribute towards maintaining the companies' competitiveness in times of crisis.

Third, our paper contributes to the sparse literature that examines firms' behavior over the business cycle. In an early article, Mascarenhas and Aaker (1989) note that “[...] the impact of the business cycle on firm strategy has been neglected in strategy research” (p. 199). More recently, in their survey article, Bromiley *et al.* (2008) note: “[referring to the previous quote] This lament is as true today as it was almost 20 years ago. Indeed, most scholars continue to ignore one of the most important, but least developed, research streams in all of management strategy and organizational science—strategic business cycle management” (p. 207). A potential reason for the lack of research is the difficulty in identifying a plausible counterfactual of how companies would have behaved absent cyclical fluctuations. In this regard, the Great Recession offers a unique laboratory to study firms' responses to macroeconomic shocks. Indeed, as mentioned, a distinguishing feature of the Great Recession is the role played by house prices, which allows us to compare firms that are more severely affected by the recession with firms that are less affected (analogous to a “treatment” versus “control” group).

Fourth, our paper contributes to the literature in macroeconomics that studies the Great Recession. This literature aims to understand what led to the crisis and ultimately the drop in employment (e.g., Chodorow-Reich, 2014; Giroud and Mueller, 2015; Mian and Sufi, 2011, 2014; Mian *et al.*, 2013). In contrast, our study examines how companies adjust their strategic resources during the crisis. In this vein, our work echoes Mian and Sufi's (2010) call for research that uses micro data to sharpen our understanding of what happened during the crisis.

Finally, our study calls for future research. In particular, a finer-grained analysis of the four strategic resources would shed further light on the underlying mechanisms. For example, while our results show that companies layoff employees, an important question is *which* employees are being laid off.

Based on our theoretical arguments, one may expect companies to lay off employees whose role is inessential for competitiveness and long-term survival. Examining such 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.

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**Table 1. Summary statistics***Panel A. Descriptive statistics*

Variable	N	Mean	SD	1	2	3	4	5	6	7	8	9	10
1 $\Delta \text{Log}(\text{Employees})$	3,538	-0.038	0.416										
2 $\Delta \text{CAPEX/PPE}$	3,538	-0.031	0.311	0.298									
3 $\Delta \text{R\&D/Assets}$	1,785	-0.001	0.037	0.439	0.234								
4 $\Delta \text{KLD-index}$	1,980	0.023	0.954	0.048	0.016	-0.011							
5 Size	3,538	6.373	1.997	0.039	-0.009	0.084	-0.009						
6 ROA	3,538	0.058	0.193	0.146	0.089	0.299	0.006	0.355					
7 Tobin's Q	3,538	2.072	1.625	0.131	0.099	0.123	-0.010	-0.303	-0.196				
8 Leverage	3,538	0.193	0.197	-0.065	-0.037	-0.048	0.001	0.293	0.118	-0.159			
9 Cash holdings	3,538	0.201	0.238	-0.002	0.015	-0.048	-0.031	-0.427	-0.464	0.447	-0.360		
10 House price shock	3,538	0.149	0.122	-0.030	-0.033	-0.018	-0.021	-0.116	-0.087	0.098	-0.054	0.172	
11 Housing supply elasticity	3,120	1.539	0.855	-0.015	0.024	0.032	0.006	0.110	0.145	-0.125	0.123	-0.267	-0.494

*Panel B. Descriptive analysis*

Variable	N	Mean	SE (Mean)	Median	SE (Median)
1 $\Delta \text{Log}(\text{Employees})$	3,538	-0.038***	0.006	-0.018***	0.004
2 $\Delta \text{CAPEX/PPE}$	3,538	-0.031***	0.007	-0.045***	0.003
3 $\Delta \text{R\&D/Assets}$	1,785	-0.001	0.002	0.000	0.003
4 $\Delta \text{KLD-index}$	1,980	0.023	0.022	0.000	0.171

Notes. Panel A provides descriptive statistics for the variables used in the analysis. The variables in rows 1-4 are changes from 2007-2009. The variables in rows 5-9 are computed in 2007. *House price shock* is the percentage decrease in the Zillow Home Value Index (ZHVI) from December 2006 until December 2009 in the firm's MSA. Saiz' (2010) *housing supply elasticity* is time-invariant. Panel B provides standard errors for the means and medians, along with their significance level. For means, standard errors are clustered at the state level. For medians, standard errors are block-bootstrapped at the state level using 500 bootstraps. \*, \*\*, and \*\*\* denotes significance at the 10%, 5%, and 1% level, respectively.

**Table 2. OLS regressions**

	Changes during the Great Recession (2007-2009)			
	$\Delta \text{Log}(\text{Employees})$	$\Delta \text{CAPEX/PPE}$	$\Delta \text{R\&D/Assets}$	$\Delta \text{KLD-index}$
	(1)	(2)	(3)	(4)
House price shock	-0.099** (0.049)	-0.104*** (0.032)	-0.004 (0.006)	-0.084 (0.129)
Size	0.009** (0.004)	-0.002 (0.002)	-0.000 (0.001)	0.029** (0.014)
ROA	0.370*** (0.074)	0.206*** (0.072)	0.064*** (0.005)	-0.046 (0.110)
Tobin's Q	0.043*** (0.006)	0.022*** (0.005)	0.004*** (0.001)	0.018* (0.011)
Leverage	-0.119*** (0.045)	-0.038* (0.022)	-0.004 (0.006)	-0.067 (0.086)
Cash holdings	-0.001 (0.043)	0.022 (0.039)	0.015*** (0.003)	-0.154 (0.103)
Industry fixed effects	Yes	Yes	Yes	Yes
Regression type	OLS	OLS	OLS	OLS
Observations	3,538	3,538	1,785	1,980
R-squared	0.07	0.03	0.15	0.03

Notes. Standard errors (reported in parentheses) are clustered at the state level. \*, \*\*, and \*\*\* denotes significance at the 10%, 5%, and 1% level, respectively.

**Table 3. 2SLS regressions**

	First stage	Second stage (IV)			
	Changes during the Great Recession (2007-2009)				
	House price shock	$\Delta \text{Log}(\text{Employees})$	$\Delta \text{CAPEX/PPE}$	$\Delta \text{R\&D/Assets}$	$\Delta \text{KLD-index}$
	(1)	(2)	(3)	(4)	(5)
Housing supply elasticity	-0.070*** (0.012)				
House price shock (instr.)		-0.145*** (0.051)	-0.087** (0.045)	-0.003 (0.009)	-0.119 (0.163)
Size	0.003** (0.001)	0.008** (0.005)	-0.000 (0.003)	0.001 (0.001)	0.030** (0.015)
ROA	0.005 (0.012)	0.381*** (0.083)	0.239*** (0.074)	0.067*** (0.006)	-0.008 (0.122)
Tobin's Q	-0.001 (0.001)	0.045*** (0.005)	0.021*** (0.006)	0.004 (0.001)	0.017* (0.011)
Leverage	-0.012 (0.011)	-0.131*** (0.050)	-0.055** (0.023)	-0.001 (0.006)	-0.075 (0.090)
Cash holdings	-0.003 (0.011)	-0.031 (0.048)	0.020 (0.041)	0.018*** (0.004)	-0.141 (0.101)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Regression type	First stage	IV	IV	IV	IV
Observations	3,120	3,120	3,120	1,613	1,805
R-squared	0.26	0.07	0.03	0.16	0.03

Notes. Standard errors (reported in parentheses) are clustered at the state level. \*, \*\*, and \*\*\* denotes significance at the 10%, 5%, and 1% level, respectively.

**Table 4. Cross-sectional heterogeneity**

	Changes during the Great Recession (2007-2009)			
	$\Delta$ R&D/Assets	$\Delta$ KLD-Index	$\Delta$ R&D/Assets	$\Delta$ KLD-index
	(1)	(2)	(3)	(4)
House price shock (instr.)	0.006 (0.018)			
House price shock (instr.) $\times$ (R&D intensity < 25th Pctl.)	-0.024** (0.011)			
(R&D intensity < 25th Pctl.)	-0.001 (0.002)			
House price shock (instr.)		0.069 (0.267)		
House price shock (instr.) $\times$ (CSR sensitivity < 25th Pctl.)		-0.655** (0.335)		
(CSR intensity < 25th Pctl.)		-0.049 (0.040)		
House price shock (instr.)			0.010 (0.010)	0.358 (0.260)
House price shock (instr.) $\times$ (KZ-index > 75th Pctl.)			-0.021* (0.011)	-0.773** (0.341)
(KZ-index > 75th Pctl.)			-0.002 (0.002)	-0.121** (0.060)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Regression type	IV	IV	IV	IV
Observations	1,613	1,805	1,613	1,805
R-squared	0.16	0.03	0.16	0.03

Notes. *R&D intensity < 25th Pctl.* (*CSR sensitivity < 25th Pctl.*) is a dummy variable indicating whether the company operates in a 2-digit SIC industry whose R&D intensity (CSR sensitivity) is in the bottom quartile across all industries. *KZ-index > 75th Pctl.* is a dummy variable indicating whether the index of Kaplan and Zingales (1997) is in the top quartile across all firms. Control variables include *size*, *ROA*, *Tobin's Q*, *leverage*, *cash holdings*, all measured in 2007. Standard errors (reported in parentheses) are clustered at the state level. \*, \*\*, and \*\*\* denotes significance at the 10%, 5%, and 1% level, respectively.

**Table 5. Firm performance**

	Performance after the Great Recession (2010-2011)					
	ROA	NPM	ROA	NPM	ROA	NPM
	(1)	(2)	(3)	(4)	(5)	(6)
No reduction in R&D	0.020** (0.008)	0.090** (0.037)				
No reduction in KLD-index			0.005* (0.003)	0.031** (0.015)		
No reduction in KLD-index and R&D					0.031** (0.013)	0.104*** (0.035)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Regression type	OLS	OLS	OLS	OLS	OLS	OLS
Observations	1,528	1,528	1,791	1,791	929	929
R-squared	0.15	0.22	0.24	0.37	0.25	0.26

Notes. Control variables include *size*, *ROA*, *Tobin's Q*, *leverage*, *cash holdings*, all measured in 2007. Standard errors (reported in parentheses) are clustered at the state level. \*, \*\*, and \*\*\* denotes significance at the 10%, 5%, and 1% level, respectively.

**Appendix Table 1. Robustness**

	Changes during the Great Recession (2007-2009)			
	$\Delta \text{Log}(\text{Employees})$	$\Delta \text{CAPEX/PPE}$	$\Delta \text{R\&D/Assets}$	$\Delta \text{KLD-index}$
<i>Panel A. State-level house prices</i>				
House price shock (instr.)	-0.110** (0.055)	-0.142*** (0.041)	-0.001 (0.009)	-0.086 (0.169)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Regression type	IV	IV	IV	IV
Observations	3,120	3,120	1,613	1,805
R-squared	0.07	0.03	0.16	0.03
<i>Panel B. Geographically concentrated companies</i>				
House price shock (instr.)	-0.170** (0.084)	-0.204** (0.103)	-0.001 (0.022)	-0.051 (0.281)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Regression type	IV	IV	IV	IV
Observations	484	484	238	199
R-squared	0.14	0.09	0.28	0.17
<i>Panel C. Excluding industries with global demand (tradable sector)</i>				
House price shock (instr.)	-0.156** (0.078)	-0.144*** (0.046)	-0.001 (0.007)	-0.024 (0.186)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Regression type	IV	IV	IV	IV
Observations	1,589	1,589	432	938
R-squared	0.06	0.04	0.21	0.06

**Appendix Table 1**  
**(continued)**

	$\Delta \text{Log}(\text{Employees})$	$\Delta \text{CAPEX/PPE}$	$\Delta \text{R\&D/Assets}$	$\Delta \text{KLD-index}$
<i>Panel D. Controlling for pre-crisis levels and pre-trends (i.e., <math>y_{2007}</math> and <math>\Delta y_{2002-2007}</math>)</i>				
House price shock (instr.)	-0.120** (0.061)	-0.070** (0.034)	0.001 (0.011)	-0.064 (0.559)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Regression type	IV	IV	IV	IV
Observations	2,099	2,099	1,179	523
R-squared	0.07	0.11	0.13	0.04
<i>Panel E. Common sample</i>				
House price shock (instr.)	-0.129** (0.063)	-0.105** (0.051)	0.002 (0.010)	-0.136 (0.166)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Regression type	IV	IV	IV	IV
Observations	946	946	946	946
R-squared	0.10	0.03	0.11	0.01
<i>Panel F. Alternative dependent variables</i>				
	$\Delta \text{Log}(1 + \text{CAPEX})$	$\Delta \text{Log}(1 + \text{R\&D})$	$\Delta \text{Log}(1 + \text{KLD-index})$	$\Delta \text{KLD-index (net)}$
House price shock (instr.)	-0.223*** (0.078)	-0.045 (0.082)	-0.023 (0.112)	-0.106 (0.095)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Regression type	IV	IV	IV	IV
Observations	3,120	1,613	1,805	1,805
R-squared	0.07	0.21	0.05	0.05

Notes. Control variables include *size*, *ROA*, *Tobin's Q*, *leverage*, *cash holdings*, all measured in 2007. Standard errors (reported in parentheses) are clustered at the state level. \*, \*\*, and \*\*\* denotes significance at the 10%, 5%, and 1% level, respectively.