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Effects of firm-, industry-, and country-level innovation on firm performance

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Abstract

Marketing strategists seek to identify drivers of firm performance and their relevant boundaries. To date, most research evidence would tell them that competition is a negative force, but this study challenges that conventional wisdom by drawing on network externalities theory and related strategy research. In particular, resources that exist outside the organization may benefit the performance of firms in a network, through positive spillover effects. For example, innovation efforts at the industry and country levels can have positive impacts on a focal firm's performance, with influences that are even more prominent than the effect of its firm-level innovation. Due to their distinctions from firm-level innovation, these innovation efforts should be leveraged strategically and uniquely, according to the specific business environment. This research therefore broadens understanding of drivers of firm performance beyond the firm level; it also provides important implications for marketing practice.

Keywords Innovation · Environmental factors · Industry · Country · Performance

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1 Introduction

In research that seeks to specify the causes for variations in firm performance (e.g., Bamiatzi et al. 2016; Makino et al. 2004; Short et al. 2007), key factors arise at various levels (e.g., country, industry, firm). Along with a general agreement that firm performance depends on multiple factors at various levels, studies in this tradition tend to assume competition hinders a focal firm's performance (Chen et al. 2009). But the theory of network externalities, as well as evidence regarding cooperative behaviors among firms, suggests a challenge to this conventional wisdom. Competition among firms in a network, as might be manifested in their investments in innovation, might benefit every firm in that network, due to industry clustering and knowledge spillover effects (Chang and Xu 2008).

Although strategy research acknowledges performance drivers at levels other than the firm level (Bamiatzi et al. 2016), innovation literature tends to prioritize firm-level innovation (see Table 1), with the assumption that firm performance relies primarily on individual achievements (e.g., "star" scientists) and sustainable leverage provided by the organization (Brower and Nath 2018; Slater et al. 2011). However, innovation-oriented collaborations are increasingly common (Hess and Rothaermel 2011; Kang and Park 2012), and we know that industry and country affiliations exert strong influences on firms. Therefore, accurate explanations for innovation-related variance in performance need to account for industry- and country-level factors. In a broader sense, resources that exist across firms, such as due to industry clustering and knowledge spillover, may be pertinent. In an innovation context, some notable resources clearly exceed organizational boundaries, which are in the form of industry-level innovation and country-level innovation. For example, at the industry level, Ford and General Motors, two fierce rivals in the automobile industry, collaborated by pooling their innovation teams to develop new automatic transmissions, which led to common parts and economies of scale. At the country level, the British government's innovation policy encourages collaborative R&D efforts among its businesses, by creating knowledge transfer networks and fiscal incentives, all of which can spur new technologies and create new industries.

Therefore, considering the prominent focus in innovation literature on firm-level innovation, rather than broader domains, we seek to fill a research gap by addressing two main research questions:

> RQ1:In addition to firm-level innovation, do industry-level innovation and country-level innovation positively influence firm performance?
> RQ2:If these two levels of innovation positively influence performance, how do environmental factors alter their effects?

With regard to RQ2, innovation literature has cited the interaction effects of environmental moderators (i.e., competitive intensity, low- versus high-tech industries, and economic growth) with firm-level innovation (Table 1). By considering industry- and country-level innovation, we also seek to determine whether and how their impacts might vary with environmental moderators. Our findings inform innovation researchers and managers that industry- and country-level aspects of innovation do not just exist but rather can drive firm performance. In this sense, our consideration of the interaction

Table 1 Empirical research on the impact of innovation

Research	Firm-level innovation	Industry-level innovation	Country-level innovation	Industry-level environmental moderators	Country-level environmental moderators	Interaction effects, firm-level innovation	Interaction effects, industry- and country-level innovation	Outcome variables
This research	✓	✓	✓	Competitive intensity; low-tech vs. high-tech industry	Economic growth	✓	✓	Tobin's Q and ROA
Atuahene-Gima (1996)	✓			Service vs. product		✓		Success of new products/services
Bloom and Van Reenen (2002)	✓			Market uncertainty		✓		Productivity and market value
Gatignon and Xuereb (1997)	✓			Demand uncertainty; market growth; competitive intensity		✓		Innovation performance
Griffith et al. (2006)	✓				Various European country comparisons	✓		Productivity
Hult et al. (2004)	✓			Market turbulence		✓		Business performance
Jansen et al. (2006)	✓			Environmental dynamism; competitiveness		✓		Unit's average profitability
Jiménez-Jiménez and Sanz-Valle (2011)	✓			Industrial turbulence		✓		Organizational performance
Li and Atuahene-Gima (2001)					✓			Perceived dysfunctional competition; institutional support;

Table 1 (continued)

Research	Firm-level innovation	Industry-level innovation	Country-level innovation	Industry-level environmental moderators	Country-level environmental moderators	Interaction effects, firm-level innovation	Interaction effects, industry- and country-level innovation	Outcome variables
								environmental turbulence
	✓		New technology venture performance					
Rubera and Kirca (2012)	✓			Low-tech vs. high-tech industry	Western vs. non-Western country	✓		Firm value; market position; financial position
Thornhill (2006)	✓			Industry dynamism		✓		ROI
Zahra (1996)	✓			Environmental dynamism, hostility, and heterogeneity		✓		ROA

effects associated with industry- and country-level aspects of innovation provide a more complete understanding of non-firm-level performance drivers.

To answer the research questions, we leverage the Compustat database and analyze 4530 firms that operate in 794 industries with headquarters in 39 countries. Although we account for firm-level innovation, we find that industry- and country-level innovation influences firm performance positively; they appear even more important than firm-level innovation in explaining the variances in firm performance. Moreover, we find significant interaction effects of the environmental moderators with both industry- and country-level innovations, in directions that conflict with those of the interaction effects involving firm-level innovation. Our findings convey the vitally important message that firm-, industry-, and country-level forms of innovation have unique effects and different implications for firm performance. Accordingly, we offer practicable insights; for example, firms should leverage firm-level innovation in competitive markets but industry-level innovation in high-tech industries.

2 Conceptual framework

2.1 Impacts of industry- and country-level innovation on firm performance

In line with previous research into firm performance variance (Bamiatzi et al. 2016; Makino et al. 2004; Short et al. 2007), we anticipate that strategic resources such as innovation exist within organizational boundaries (firm-level innovation) and beyond them (industry- and country-level innovation). As a fundamental premise, we posit that firms affect and are affected by other firms, through activities such as communication, coordination, collaboration, and integration (Håkansson and Snehota 1989). These activities lead to the creation of intangible resources such as knowledge, intelligence, and relationships, which exist only because firms interact, directly or indirectly (Chang and Xu 2008). When firms in a particular industry or country become interrelated through their activities, such as sharing knowledge within networks or establishing innovation alliances to exploit one another's expertise, they can share in the results of industry- and country-level innovation.

Network externalities theory also suggests that when firms in a network agglomerate in certain areas, such as technology and innovation, they have better access to information about market and technology trends and experience better cooperation, such that they can retrieve and leverage the resources and capabilities of other firms in their network (Chang and Park 2005; Porter 1998). According to Chang and Xu (2008), agglomeration (or spillover) effects for firms in a network are greater if firms locate near one another, their educated employees are more mobile, and their governments encourage collaboration. These positive outcomes of interfirm relationships (i.e., industry clustering and spillover effects) enhance firm performance. Drawing on this stream of literature, we suggest that when firms deploy industry- and country-level innovation, which is a form of cooperating and agglomerating, they accelerate the emergence of network externalities and spillover effects and enhance firm performance.

2.2 Environmental factors in interaction with industry- and country-level innovation

The studies in Table 1 investigate interaction effects between firm-level innovation and environmental moderators at the country level (Griffith et al. 2006; Rubera and Kirca 2012) and the industry level (Atuahene-Gima 1996; Gatignon and Xuereb 1997). The merit of our study is that when we introduce industry- and country-level innovation into the model, we test their interactive effects with these environmental moderators as well. Table 1 also indicates that researchers often study the competitive intensity of markets (Gatignon and Xuereb 1997; Jansen et al. 2006) and the frequency with which markets change (Bloom and Van Reenen 2002; Rubera and Kirca 2012), as industry-level contingencies. Two studies that examine various impacts of firm-level innovation across countries (Griffith et al. 2006; Rubera and Kirca 2012) conclude that the different levels of economic growth across countries are an important factor to consider when examining innovation. Accordingly, to address RQ2 (interaction effects), we select two industry-level moderators, competitive intensity and low- versus high-tech industries, and one country-level moderator, economic growth.

For industry-level innovation to exert an impact on firm performance, firms must engage in activities designed to communicate, coordinate, collaborate, and/or integrate in their industry. However, firms in competitive or even hostile environments may reduce such activities—especially those related to innovation or new technologies—to avoid intellectual property risks and the likelihood of their competitors outperforming them (Felin and Zenger 2014). As firms become more cautious about sharing information with others, the impact of industry-level innovation may be mitigated. Intensive innovation and development activities in high-tech industries, along with rapid changes in technology trends, suggest that collaborations among firms in these industries may have synergistic effects that magnify the effects of industry-level innovation.

Country-level innovation is a product of the interrelatedness of firms within the same country. With tremendous financial and infrastructural support for firm-level innovation, firms in countries with high economic growth are more equipped than those in slowly growing countries to advance technologies on their own (Levine 1997). Thus, country-level innovation may not have much additional impact on firm performance.

3 Data, variables, and method

3.1 Data

We drew our data from the Compustat database, a commonly used and comprehensive database for research into the drivers of firm performance (Karniouchina et al. 2013). We selected a 5-year period (2010–2014) and a lagged structure for the analysis to draw causal inferences (Short et al. 2007). Our data included 4530 firms that operate in 794 industries and have headquarters in 39 countries. We measured innovation from 2010 to 2012 and performance from 2013 to 2014. To provide stable measures, we used a 3-year period for innovation and a 2-year period for performance (Keats and Hitt 1988).

3.2 Variables and method

Multilevel innovation In line with Keizer et al. (2002), we used research and development (R&D) intensity (ratio of R&D expenses to firms' total sales) as a proxy for innovation. We created values for industry-level (country-level) innovation by averaging firm-level innovation for all firms in an industry (country). To ensure the rigor of our empirical findings, we also created alternative measures for industry- and country-level innovation and used them for our first robustness check (RC1). Instead of averaging, we computed a cumulative version, in which we summed the R&D expenses of all firms in an industry or a country and divided it by total sales in that industry or country.

Competitive intensity We followed Jiménez et al. (2013) and used the Herfindahl–Hirschman index (HHI) to measure the degree of competition among firms in an industry. We computed the HHI by summing the squared market shares of all firms in each industry. The higher the HHI, the less competitive the industry is.

Low-tech versus high-tech industries We used the Bureau of Labor Statistics' list of high-technology intensive industries (Heckler 1999) to construct the low-tech versus high-tech variable. Of all the industries in our data set, 26.7% (212 industries) were high-tech industries.

Economic growth Following Borensztein et al. (1998), we measured economic growth using the growth rate of gross domestic product (GDP) per capita, that is, according to the level of the growth rate of GDP per capita. Of all the countries in our data set, 48.7% (19 countries) exhibited high economic growth.

Firm performance We measured firm performance using Tobin's Q ratio, with Bharadwaj et al.'s (1999) formula. Tobin's Q is forward-looking and reflects future profitability (Jayachandran et al. 2013), which is especially appropriate in our context because innovation is more likely to influence the future profitability of firms than their present profitability. However, for rigor, we included return on assets (ROA) as an additional performance measure (RC2).

Control variables Following prior research (Karniouchina et al. 2013; Rubera and Kirca 2012), we included the following control variables in our model: interactions between firm-level innovation and the selected environmental moderators, which has been a main focus of extant innovation research; country status (Western or non-Western); intangible assets; industry maturity;[1] and available slack.[2]

We used hierarchical linear multilevel modeling (HLM) to test the effects of innovation at three levels (firm, industry, country) on performance. The HLM technique is appropriate for this study, because of the hierarchical nature of the data (i.e., firms are nested in industries, which are nested in countries) and because it provides for simultaneous partitioning of the variance–covariance

[1] Average cash flows of all firms in a given industry
[2] Ratio of current assets to current liabilities (Cheng and Kesner 1997)

components (Raudenbush 2004). We first included the three innovation variables, to answer RQ1. We then incorporated the two industry-level moderators (competitive intensity, low- vs. high-tech industries) and one country-level moderator (economic growth) to address RQ2.

4 Results

4.1 Variance decomposition

Table 2 contains summary statistics and correlations of all continuous variables in the analyses. When we decompose variance in firm performance (Tobin's Q), we find that the firm level accounts for 69% of this variance, the industry level accounts for 18%, and the remaining 13% occurs between countries. However, when we include the control variables and the three levels of innovation in the model, by contrasting the variance explained by innovation at the firm, industry, and country levels, we find that firm-level innovation provides 26.0% of the total variance explained by innovation, industry-level innovation contributes 34.0%, and country-level innovation accounts for the remaining 40.0%. This result suggests that industry- and country-level innovations are more important than firm-level innovation in explaining firm performance.

Table 2 Descriptive statistics and correlation matrix for continuous variables

Variables	Mean	Standard deviation	1	2	3	4	5	6	7
1. Tobin's Q	1.57	1.30							
2. Firm-level innovation	0.17	1.23	0.21**						
3. Industry-level innovation	0.17	0.68	0.28**	0.55**					
4. Country-level innovation	0.17	0.34	0.27**	0.28**	0.50**				
5. HHI	0.06	0.05	0.09**	0.10**	0.18**	0.20**			
6. Available slack	0.13	0.54	0.01	0.02	0.01	− 0.01	0.00		
7. Intangible asset	3.35	5.16	− 0.17**	− 0.13**	− 0.13**	− 0.13**	0.03*	− 0.06**	
8. Industry maturity	0.05	0.07	− 0.16**	− 0.33**	− 0.60**	− 0.44**	− 0.12**	− 0.01	0.16**

**$p < 0.01$, *$p < 0.05$

This table presents Pearson correlations. Listwise $N = 4530$.

Table 3 HLM results predicting firm performance (Tobin's Q)

	Variables	Model 1 (firm-level)		Model 2 (three levels)		Model 3 (interaction effects)	
		γ	SD	γ	SD	γ	SD
Multilevel innovation	Firm-level innovation	1.76**	0.72	1.78**	0.71	3.06***	1.02
	Industry-level innovation			0.85***	0.26	0.34	0.33
	Country-level innovation			0.56***	0.15	0.68***	0.14
Environmental moderators	HHI	1.27*	0.74	1.32*	0.77	1.39*	0.81
	High-tech industries	0.22***	0.05	0.21***	0.05	0.21***	0.05
	Economic growth	− 0.11	0.18	0.19	0.15	0.47***	0.16
Covariates	Western countries	0.26	0.19	0.30*	0.16	0.51***	0.16
	Available slack	0.50	0.33	0.55	0.34	0.50	0.33
	Intangible asset	− 0.03**	0.01	− 0.03**	0.01	− 0.03**	0.01
	Industry maturity	3.20***	0.38	3.30***	0.38	3.37***	0.38
Interaction effects related to firm-level innovation	Firm-level innovation × HHI					− 9.40**	3.98
	Firm-level innovation × high-tech industries					− 1.19***	0.44
	Firm-level innovation × economic growth					1.36	1.34
Interaction effects related to industry- and country- level innovation	Industry-level innovation × HHI					1.94**	0.98
	Industry-level innovation × high-tech industries					0.36***	0.13
	Country-level innovation × economic growth					− 1.64*	0.88

***$p < 0.01$, **$p < 0.05$, *$p < 0.10$

γ unstandardized regression coefficient obtained in HLM. $N = 4530$. The HHI indicates how uncompetitive or stable an industry is, so a higher HHI implies a less competitive industry. Low-tech industries, low economic growth, and non-Western countries are reference groups

4.2 Main effects

Table 3 shows the results from running the three models sequentially. Model 1, consistent with extant literature, shows that firm-level innovation positively affects performance ($\gamma_{firm} = 1.76$, $p < 0.05$). In Model 2, when we include industry- and country-level innovation variables, the results suggest that all three levels of innovation have positive and significant impacts on performance ($\gamma_{country} = 0.56$, $p < 0.05$; $\gamma_{industry} = 0.85$, $p < 0.05$; $\gamma_{firm} = 1.78$, $p < 0.05$).

Thus, in addition to firm-level innovation, both industry- and country-level innovations positively influence firm performance.

4.3 Interaction effects

In Model 3, in which we include all interactions, the effects of industry-level (country-level) innovation are moderated by industry-level (country-level) environmental moderators. Specifically, competitive intensity ($\gamma = 1.94$, $p < 0.05$) negatively moderates industry-level innovation, but its impact is more positive in high-tech industries ($\gamma = 0.36$, $p < 0.05$). The impact of country-level innovation is weakened in economically growing countries ($\gamma = -1.64$, $p < 0.10$).

An intriguing finding is that the moderating effects of environmental variables on industry- and country-level innovation are opposite of those on firm-level innovation. These discrepancies may stem from inherent differences between firm-level innovation and industry- or country-level innovation. For example, firm-level–focused research suggests that key firm variables (e.g., market orientation, customer satisfaction, innovation) more effectively drive important firm outcomes in highly competitive environments than in stable environments (Luo et al. 2007); our results support this contention. However, as previously indicated, in competitive or hostile environments, firms become cautious when sharing information and collaborating with other competitors in their industry (Felin and Zenger 2014). That caution impedes the effect of industry-level innovation on firm performance. To enjoy the benefits of industry- and country-level innovation, firms must reach out, cooperate, and agglomerate. However, such behavior may be less likely in environments that are competitive or growing.

4.4 Robustness checks

For RC1, we used alternative measures of industry- and country-level innovation. For RC2, we analyzed our data with ROA as the dependent variable. Table 4 displays the findings. Compared with our main analyses (Table 3), we find largely consistent results and just a few discrepancies. Specifically, in RC1, we find that country-level innovation does not have a significant impact on performance, and economic growth fails to alter that impact. Considering the vast number of firms in a country, the cumulative measure becomes inefficient for capturing the essence of firms in a country that are cooperating. Moreover, RC2 reveals a notable difference, in that firm-level innovation negatively affects ROA. This result is plausible, because ROA is a short-term measure (Short et al. 2007), and it contrasts with Tobin's Q, which is a forward-looking measure. Innovation expense at the firm level can have an adverse impact on a firm's short-term performance (Carbonell et al. 2004), and RC2 accurately reflects this impact.

5 Discussion

Strategy research pertaining to firm performance suggests that unique drivers of firm performance can be linked to firms, industries, strategic groups, and countries (e.g., Bamiatzi et al. 2016). The cooperative behavior of firms within countries or industries reflects network externalities theory, which predicts that resources beyond

Table 4 Robustness checks: HLM results predicting firm performance

	Variables	RC1: Alternative operationalizations for innovation						RC2: Alternative firm performance					
		Model 1 (three levels)		Consistent with main results?	Model 2 (interaction effects)		Consistent with main results?	Model 1 (three levels)		Consistent with main results?	Model 2 (interaction effects)		Consistent with main results?
		γ	SD		γ	SD		γ	SD		γ	SD	
Multilevel innovation	Firm-level innovation	1.62**	0.72	✓	3.91***	1.21		-0.15***	0.03	x	-0.13***	0.04	
	Industry-level innovation	4.91***	0.59	✓	1.65	1.36		0.06***	0.01	✓	− 0.01	0.03	
	Country-level innovation	− 3.61	3.28	x	− 5.81	3.55		0.01	0.01	x	0.02**	0.01	
Environmental moderators	HHI	2.48***	0.93		2.21**	1.03		− 0.00	0.03		− 0.04	0.03	
	High-tech industries	0.22***	0.06		0.20***	0.07		0.00	0.00		0.00	0.00	
	Economic growth	− 0.10	0.15		− 0.37	0.23		− 0.01	0.01		0.01	0.01	
Covariates	Western countries	0.21	0.20		0.13	0.21		0.00	0.01		0.02*	0.01	
	Available slack	0.04	0.10		0.04	0.10		− 0.04*	0.02		− 0.01	0.01	
	Intangible asset	− 0.0-1***	0.00		− 0.0-1***	0.00		0.00***	0.00		0.00***	0.00	
	Industry maturity	2.35***	0.38		2.45***	0.37		0.81***	0.03		0.82***	0.03	
Interaction effects related to firm-level innovation	Firm-level innovation × HHI				− 15.-20**	5.96					0.18	0.18	
	Firm-level innovation × high-tech industries				− 1.9-0***	0.67					-0.06***	0.01	

Table 4 (continued)

	Variables	RC1: Alternative operationalizations for innovation					RC2: Alternative firm performance				
		Model 1 (three levels)		Consistent with main results?	Model 2 (interaction effects)		Model 1 (three levels)		Consistent with main results?	Model 2 (interaction effects)		Consistent with main results?
		γ	SD		γ	SD	γ	SD		γ	SD	
	Firm-level innovation × economic growth				1.28	1.39				0.01	0.05	
Interaction effects related to industry- and country- level innovation	Industry-level innovation × HHI				20.00**	9.64	✓			0.27	0.25	x
	Industry-level innovation × high-tech industries				2.11*	1.24	✓			0.07***	0.02	✓
	Country-level innovation × economic growth				8.72	6.19	x			-0.09**	0.04	✓

***$p < 0.01$, **$p < 0.05$, *$p < 0.10$

γ unstandardized regression coefficient obtained in HLM. $N = 4530$. The HHI indicates how uncompetitive or stable an industry is, so a higher HHI implies a less competitive industry. Low-tech industries, low economic growth, and non-Western countries are reference groups

organizations' boundaries can strengthen a firm's performance. By using innovation as an example of a performance driver, we reveal some important implications for researchers and managers.

5.1 Theoretical implications

First, prior research predicts that relationships among firms in a network likely take the form of competition that hurts some firms' bottom lines (Chen et al. 2009). Our study challenges this conventional wisdom by suggesting that drivers of firm performance can be external to the firm—that is, reflecting the industries or economies in which the firm operates. If firms within a network agglomerate to engage in innovation—such as by investing heavily in innovation—they are not impaired by agglomeration. Instead, they benefit from the publicly available resources of industry- and country-level innovation, through sharing and collaboration. We provide a more comprehensive view of interfirm effects, in which positive spillover effects can occur and strongly affect firm performance. We also enrich innovation research, which focuses almost entirely on firm-level innovation, by introducing a broader understanding of the impact of innovation beyond the firm level.

Second, similar to firm-level performance drivers, the impacts of industry- and country-level innovation are altered by environmental contingencies. Perhaps even more important, we show that the directions of the interaction effects contrast those that emerge from firm-level innovation. This finding reinforces the need to understand resources that exist beyond organizational boundaries to determine whether firms should leverage their own resources or reach out to obtain external resources.

Third, firm performance research mainly decomposes performance variance at different levels (i.e., Short et al. 2007) or simultaneously examines different performance drivers from various levels (i.e., Rothaermel and Hess 2007). We extend this literature stream by propounding a new perspective, in which performance drivers traditionally viewed as firm-level drivers may have counterparts outside organizational boundaries, which also influence firm performance. For example, innovation affects firm performance at three levels: firm-, industry-, and country-level innovation. Intriguingly, and inconsistent with prior research that suggests firm-level drivers explain the most variance in firm performance (Short et al. 2007), we find that firm-level innovation is not as important as the other two forces.

5.2 Managerial implications

Firms should be aware that their own resources and capabilities are not the only levers they can use to succeed in business; they can deploy outside resources. When other firms in a firm's network invest heavily in resources such as innovation, it is not necessarily deleterious to the firm, as long as that firm is willing to collaborate with others in the network and take advantage of the benefits of agglomeration and spillover effects. In effect, outside resources may be more efficient in driving performance than firms' internal resources. Thus, companies need to leverage industry- and country-level innovation by fostering or participating in collaborations, even with their competitors. Moreover, our research offers guidelines for managers, regarding when they should exploit their own resources and when to reach out for assistance. In competitive, hostile

markets or low-tech industries, it may be better for firms to rely on their own innovation resources; in high-tech industries or passive markets, it is optimal to leverage industry-level innovation. Also, firms in slowly growing countries should explore outside technologies by collaborating with other entities and exchanging information. In fast-growing countries, they should rely on government support to augment their innovation competencies.

6 Limitations and continued research

The limitations of this research indicate three main directions for continued research. First, with RC2, we provide some preliminary evidence that differences between short- and long-term performance metrics may influence innovation effects across levels. This evidence may be relevant to firms working to allocate their resources and advance their innovation efforts according to short-term versus long-term goals. Second, we include innovation as one performance driver; parallel research efforts could study other performance drivers that traditionally have been viewed at the firm level and investigate the impacts of their counterparts at other levels. Such research may strengthen our arguments and offer additional guidance to companies. Third, we restricted our sample to publicly traded firms, which tend to be large. Researchers should seek to determine if our findings hold for private and small firms.

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