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Simply Clever - The Impact of Cognitive Simplicity on Organizational Digital Strategy Orientation

Short Paper

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Abstract

This paper examines how Chief Executive Officers' (CEOs') cognition can shape firms' digital strategy orientation. Drawing on Ott and Eisenhardt's (2020) theoretical framework of decision weaving, we argue that CEOs' cognitive simplicity can be an integral factor in strategy shaping when opportunities around an organization are abundant and fleeting. Our findings show that CEOs who think persistently and coherently – in other words, simply – positively affect a focal firm's digital strategy orientation. We theorize that cognitive processes are influenced by cognitive biases such as CEO overconfidence, which positively moderates the relationship between cognitive simplicity and digital strategy orientation. Our results support the counterintuitive finding that cognitive simplicity contributes to greater digital strategy orientation and is reinforced by managerial overconfidence.

Keywords: Digital strategy orientation, decision weaving, managerial cognition, cognitive simplicity, cognitive bias, overconfidence

Introduction

Strategy literature has examined the relationship between the cognition of a focal firm's top decision-makers, mainly the chief executive officer (CEO), and strategic outcomes such as launching new product lines or entering new markets (e.g., Crossland et al. 2014). Despite these theoretical advances, the exact mechanism of how the CEO's cognitive processes shape strategic choices is conceptually unclear and theoretically underdeveloped. Recent work by Graf-Vlachy et al. (2020) suggests that cognitive complexity in CEOs may hinder strategic change. Related adverse effects, such as cognitive entrenchment (e.g., Dane 2010) or decision paralysis (e.g., Hambrick et al. 2005), are potential explanations. Taking a more positive perspective, we theorize that cognitive simplicity can help CEOs distill meaningful information from situations when stimuli are abundant, fostering organizational adaptability and increasing strategic focus. We propose the concept of cognitive simplicity as a counterpart to cognitive complexity (e.g., Graf-Vlachy et al. 2020), and we define it as the degree to which an individual engages in persistent and coherent thinking. This mode of thinking can be a challenge; as Steve Jobs put it, "[s]imple can be harder than complex: You have to work hard to get your thinking clean to make it simple" (Reinhardt 1998). Following Ott and Eisenhardt (2020), we argue that cognitively simple individuals' conscious elimination of distractions and, in turn, rigorous focus on a narrow set of tasks – i.e., simplify the perceived tasks –, minimize cognitive switching and increase cognitive control. Requiring cognitive control to reconfigure mental resources for a change in a task, cognitive switching leads to slowness and error (Monsell 2003). Cognitive control is defined as "the set of processes that organize, plan, and schedule mental operations" (VandenBos 2015, p. 203). We theorize that in order to achieve simplicity, executives must identify critical causes (e.g., Bingham and Eisenhardt, 2011) and actionable information (e.g., Thomas and McDaniel, 1990). When they have done this, they can achieve an effective strategic orientation.

This study discusses the relevance of cognitive simplicity for one recent form of strategic orientation: digital strategy. Our focus is justified for at least two reasons. First, digital technologies and innovations are continuously changing the business landscape, putting firms under constant pressure to adapt (e.g., Teece et al. 2016). Second, emerging digital infrastructures are flexible and can no longer be confined to the boundaries of a single firm or industry (e.g., Tilson et al. 2010). Thus, CEOs find themselves exposed to vast opportunity spaces that require adequate strategizing (e.g., Nambisan et al. 2019). Cognitive simplicity, we theorize, is a way for them to make sense of it without being overwhelmed by it. Departing from Ott and Eisenhardt's (2020) concept of decision weaving, we theorize that a CEO's cognitive simplicity increases a focal firm's digital strategy orientation and enables the firm to cope with the numerous, fleeting, and uncertain opportunities of the market-wide trend toward digitalization. Cognitive characteristics such as simplicity should not be considered in isolation, as they are updated as environmental conditions change (e.g., Ott and Eisenhardt 2020) and are subject to cognitive biases. Thus, it is crucial to consider other cognitive characteristics when studying cognitive simplification. One particularly influential characteristic is managerial overconfidence, which has been consistently linked to information interpretation (e.g., Malmendier and Tate 2005) and organizational outcomes (e.g., Galasso and Simcoe 2011). We theorize that overconfidence increases cognitive control and limits cognitive switching, positively moderating the relationship between cognitive simplicity and digital strategy orientation.

We make cognitive simplicity the analytical centerpiece of our study for several reasons. Managerial cognition strongly influences a firm's strategic orientation (e.g., Eggers and Kaplan 2009). However, there is an ongoing debate in the literature about whether CEO cognitive simplicity helps (e.g., Graf-Vlachy et al. 2020) or hinders strategic reorientation (e.g., Miller 1993). This question is highly relevant to a firm's digital strategy orientation, as the CEO's interpretation processes are an essential arbiter between the firm's environment and strategic actions, including the adoption and adaptation of technology (e.g., Kaplan 2008). Even with appropriate capabilities or strong incentives already in place, CEO cognition may be the crucial factor in shaping the firm's response to technological change (e.g., Eggers and Kaplan 2013).

To probe our theorizing, we create a large panel dataset leveraging recent advances of measuring CEO cognitive characteristics and a firm's strategic orientation through the automated content analysis of textual data. In the present case, we employ the quarterly conference calls and 10-K filings of Standard & Poor's 1500 (the S&P 1500) firms between 2004 and 2018. Our findings show that cognitive simplicity positively affects digital strategy orientation and CEO overconfidence positively moderates that relationship. Overall, we contribute to information system literature by showing how CEOs' cognitive characteristics influence a firm's digital strategy orientation.

Theory and Hypotheses

The digital ecodynamics affecting a firm's digital strategy are becoming increasingly complex and chaotic (e.g., El Sawy et al. 2010). The complexity and chaos bring new challenges for leaders and demand certain capabilities from the CEO in particular (e.g., Bharadwaj et al. 2013b). Following upper echelons theory (e.g., Hambrick and Mason 1984), which regards the CEO as pivotal in shaping a firm's future, the CEO's cognition connects the firm's actions to its environment, affecting what information the firm perceives, how the firm interprets that information, and why the firm makes particular decisions in response to that information (e.g., Kaplan 2008). As managers have limited processing capabilities, they construct simplified mental models (e.g., Walsh 1995) that help them cope with decision-making complexities so they don't need to process all the available information but can selectively focus their attention on a few crucial variables (e.g., Laureiro-Martinez 2014). When opportunities are abundant and fleeting, effective cognitive structures can guide a focal firm's strategy formation (e.g., Ott and Eisenhardt 2020). A key challenge for the manager is to act efficiently while remaining flexible to adapt to unforeseen circumstances (e.g., Eisenhardt 2013). Gary and Wood (2011) show that having an accurate mental model of key principles is more important for superior strategies than accurate knowledge of the entire business environment. Regarding effective strategies in volatile environments, Ott and Eisenhardt's (2020) concept of decision weaving postulates that a *sequential focus* promotes effort and persistence in a target strategy domain. A sequential focus is defined as "[...] the process by which strategists concentrate on forming the activities of a single domain until a learning plateau and then switch to the next" (Ott and Eisenhardt 2020, p. 2287) and created by limiting cognitive switching and increasing the strategist's cognitive control.

CEO Cognitive Simplicity and Digital Strategy Orientation

Digital strategy orientation provides strategic direction for organizations to nurture specific digitization strategies and select appropriate digitization initiatives (e.g., Kindermann et al. 2020). We argue that cognitive simplicity can foster the firm's digital strategy orientation. It enables persistent, effortful action and sequential focus on digital strategy.

Thinking complexly under conditions of high uncertainty may lead managers to get carried away, considering too many options and taking too much time to reach decisions (e.g., Downey and Slocum 1982). A decisive, focused CEO is needed in such circumstances, especially as the rate of technological change is opening and shutting strategic windows quickly (e.g., Bourgeois and Eisenhardt 1988). As rapid changes are inevitable, managers who think simply are likely to have a competitive advantage (e.g., Dane 2010), consciously eliminating distractions, increasing their cognitive control (e.g., Moulton et al. 2010), and maximizing their effort and persistence in their target strategy domain (e.g., Ott and Eisenhardt 2020). As Laureiro-Martinez (2014) found, cognitive simplification processes are highly correlated with attention control. Thus, cognitive simplicity can help decision-makers manage complexity by enabling them to focus and sustain attention. By contrast, cognitive complexity seems to indicate an inability to extract the essentials and prioritize in uncertain environments (e.g., Downey and Slocum 1982, Graf-Vlachy et al. 2020). This deficiency can especially slow the dynamic process of digital transformation, where strategy needs to be frequently reformulated (e.g., Chaniyas et al. 2019). Hence, we argue that managers with high cognitive simplicity are more persistent and coherent in digital strategy orientation than their peers with low cognitive simplicity. Cognitively complex individuals may become baffled thinking about alternative pathways (e.g., Graf-Vlachy et al. 2020), whereas cognitive simplicity limits cognitive switching through attention control, increasing focus. Cognitive research supports this argument by showing that frequent cognitive switching reduces effectiveness and increases task completion time (e.g., Monsell 2003). For instance, Partlow et al. (2015) show that when forming a vision – a critical part of a digital strategy – the strongest vision emerges when individuals use simple mental models reflecting only the most important contingencies.

In sum, we argue that cognitive simplicity manifests in improved cognitive control and limits cognitive switching. In the context of strategic orientation, this leads to what Ott and Eisenhardt (2020) have termed sequential focus. In contrast to parallel focus, sequential focus enables managers to persistently and coherently focus on a strategic orientation when faced with abundant, fleeting opportunities. Thus, we hypothesize:

H1: CEOs' cognitive simplicity is positively associated with a focal firm's digital strategy orientation.

CEO Overconfidence and Cognitive Simplicity

While managerial cognition drives strategy, Ott and Eisenhardt (2020) suggest that mental models change over time. This rationale is consistent with research on managerial characteristics and strategic decisions which proposes that in situations loaded with stimuli and ambiguity, cognitive biases and personal characteristics enter into the interpretation of situations and influence the decisions made (e.g., Hiller and Hambrick 2005). The cognitive bias induced by overconfidence has assumed a particularly prominent role in the literature and is often considered the most significant one (e.g., Kahneman 2011). Suggesting that it may be of particular importance in decision making for both perceived cognitive control (e.g., Hiller and Hambrick 2005) and consideration of alternatives (e.g., Schumacher et al. 2020), we propose that CEOs' overconfidence may be a critical factor in the relationship between cognitive simplicity and digital strategy orientation.

Previous work has shown that overconfidence strongly influences how individuals process and interpret information about their past performance, which consequently influences their decision-making (Chen et al. 2015; Schumacher et al. 2020). CEO overconfidence has been linked with various corporate outcomes such as acquisitions (e.g., Malmendier and Tate 2005), corporate investment (e.g., Malmendier and Tate 2008), and firm-level innovation (e.g., Galasso and Simcoe 2011). In such decision-making situations, CEOs can exert influence on the decision-making process by directing the attention of other decision-makers, communicating with them, or configuring their reward systems (e.g., Hambrick and Mason 1984). Overconfident CEOs tend to make decisions faster and dominate other members of the top management team (e.g., Engelen et al. 2015). When successful, the results are then attributed to the CEOs' abilities, and when unsuccessful, the results are attributed to bad luck (e.g., Schrand and Zechman 2012). Therefore, we argue that CEO overconfidence increases CEO cognitive control, as dissenting explanations are ruled out, and decisions are likely to be made in the CEO's favor. Mental resources are only marginally devoted to divergent explanations, strengthening persistence in formulating a clear strategy.

Given that decisions related to formulating a digital strategy are risky and yield uncertain outcomes (e.g., Yoo et al. 2012), the focus of a risk-averse strategist is likely to shift continually toward less risky alternatives (e.g., Kahneman 2011). In contrast, Schumacher et al. (2020) show that overconfident CEOs are persistent in their choice of strategic direction despite disconfirming evidence. Alternatives are not considered because of these CEOs' extreme confidence in their decisions and in their ability to overcome any post-decision challenges. Therefore, we argue that overconfidence constrains cognitive switching and thus increases focus and commitment to the targeted strategic orientation.

In sum, we predict that CEO overconfidence positively moderates the relationship between CEO cognitive simplicity and digital strategy orientation by increasing CEO cognitive control and limiting cognitive switching. This promotes sequential focus and leads to a persistent and effortful pursuit of digital strategy orientation. We hypothesize:

H2: CEO overconfidence positively moderates the relationship between cognitive simplicity and digital strategy orientation.

Methods

To create our panel dataset, we collected quarterly conference call transcripts from the Thomson Reuters StreetEvents database for firms within the S&P 1500 between 2004 and 2018. The data were matched to the corresponding 10-K filings of each firm-year observation and supplemented with firm-level financial data from the CRSP-Compustat Merged database and manager-level data from the ExecuComp database. This study's dependent variable is *digital strategy orientation*, which we define as an organization's strategic orientation toward digital innovation and transformation initiatives. Following Kindermann et al. (2020), using computer-aided text analysis, we measure Digital Strategy Orientation along the four dimensions of digital technology scope, digital capabilities, digital ecosystem coordination, and digital architecture configuration. The *digital strategy orientation* score of a firm in a given year is calculated by counting how many times words from the dimension word lists of Kindermann et al. (2020) appear in the 10-K filing and then dividing the resulting number by the total number of words. To assess our main explanatory variable, *cognitive simplicity*, we first follow the method of Graf-Vlachy et al. (2020) for measuring CEOs' cognitive complexity based on language patterns in the question-and-answer (Q&A)

portions of quarterly conference calls. Again, specific dictionaries are applied to determine the extent of the use of the language of differentiation (e.g., but, except), the language of nuance (e.g., could, might), and the language of comparison (e.g., better, earlier). Next, we invert the resulting score and take the average for each CEO-firm combination in a given year to obtain our indicator of *cognitive simplicity*.

Our main moderator is *CEO overconfidence*. Following Schrand and Zechman (2012), we capture overconfidence through a firm-specific score based on five measures of firm-level investment and financing activities that are related to managerial overconfidence. This measure derives overconfidence from a manager's decisions as reflected in industry-adjusted excess investment, industry-adjusted net dollars of acquisitions made by the firm, industry-adjusted debt duration, choice of risky debt, and industry-adjusted dividend yields. The *CEO overconfidence* indicator variable equals one if the firm has three or more of the five corporate-level overconfidence indicators in the positive range (i.e., higher than the industry mean).

We include an encompassing set of control variables. To account for persistence in corporate strategy and control for serial correlation, we introduce a one-year lag of the dependent variable *digital strategy orientation*. At the CEO level, we control for *CEO tenure* and *CEO age*, as they may affect decision-making (e.g., Hambrick et al. 2005). At the firm level, we control for *firm age* and *firm size* (log of total assets), as the adoption of dynamic strategies may vary depending on how established a firm is (e.g., Crossland et al. 2014). Furthermore, *absorbed* (based on S&GA), *unabsorbed*, and *potential slack* may influence the available resource base for strategic actions (e.g., Patel and Cooper 2014). We introduce the firm's *Altman's Z* (Altman 1968), *debt ratio*, and *R&D intensity* (e.g., Schumacher et al. 2020) to our models to account for financial constraints that may affect a firm's strategic orientation risk preferences. Moreover, strategic positioning (differentiation or cost leadership) and capital structure may affect a firm's strategic orientation (e.g., Banker et al. 2011, Crossland et al. 2014). Thus, we control for *cost leadership* and *tangibility of assets* (following Patel and Cooper 2014). To account for varying market factors, we introduce the *median industry ROA* of each 4-digit SIC code (e.g., Hambrick and Quigley 2014). Additionally, we control for the number of words by including the *total words of the CEOs* spoken in the Q&A part of the conference call (e.g., Graf-Vlachy et al. 2020) and the *total words of the 10-K filings*. Lastly, we include year effects and firm-fixed effects to control for unobserved heterogeneity in time and time-invariant firm effects, respectively. Retaining only conference calls with at least 500 words spoken by the CEO in the Q&A remarks, our final sample consists of 9,061 firm-year observations. We winsorize all continuous variables at the 1st and 99th percentiles to ensure that our results are not driven by outliers.

To examine the effect of CEO simplicity on subsequent action, we follow related studies on CEO cognition (e.g., Kaplan 2008, Graf-Vlachy et al. 2020) and analyze our panel data set using fixed-effects regression. This technique allows us to leverage both cross-sectional and longitudinal variation in our data (Wooldridge 2016) and to test only the time-varying aspects of cognitive simplicity. The variance inflation factors (VIFs) ranged between 1.03 and 3.99, well below critical thresholds of multicollinearity.

Results

The fixed-effects regression results testing the link between cognitive simplicity and a firm's digital strategy orientation, including the results of the moderating effect of CEO overconfidence, are depicted in Table 1. Model 1 in Table 1 shows a positive and statistically significant direct effect of cognitive simplicity ($\beta = 0.00090$; SE = 0.00036, CI = 0.00018, 0.00161, $p = .014$). The results support Hypothesis 1, suggesting that an increase in the level of cognitive simplicity increases the focal firm's digital strategy orientation. Model 3 shows that the direct effect of cognitive simplicity ($\beta = 0.00061$; SE = 0.00037, CI = -0.00011, 0.00134, $p = .098$) and the interaction term of CEO overconfidence and cognitive simplicity are significantly positive ($\beta = 0.00073$; SE = 0.00036, CI = 0.00003, 0.00143, $p = .041$). These results support Hypothesis 2, suggesting that an increase in the level of overconfidence increases the rate of change induced by cognitive simplicity on the focal firm's digital strategy orientation. In unreported results, we perform several complementary analyses that support the robustness of our findings. We run all models with a random-effects specification to test the time-variant aspect of cognitive simplicity and overconfidence together with their trait-like aspects. When we control for industry fixed-effects classified from 1-digit SIC code up to 4-digit SIC code and year fixed-effects, the results still support our reasoning. For instance, with the industry fixed-effects classified at the 4-digit SIC code, Model 1 shows a positive and statistically significant direct effect of $\beta = 0.00070$ (SE = 0.00032, CI = 0.00008, 0.00132, $p = .027$).

Discussion

Information systems research has long scrutinized the execution of digital strategies (e.g., White 1984). Our study has shifted the focus to another fundamental part of digital strategy – the firm’s positioning ahead of execution. Consistent with our first hypotheses, a CEO’s cognitive simplicity is positively associated with the focal firm’s digital strategy orientation. This rationale is in line with the upper echelon theory, which proposes that top managers’ characteristics shape the overall behavior of a firm (e.g., Hambrick and Mason 1984). As the underlying mechanism, we draw on the concept of sequential focus, i.e., concentrating on specific strategy domains and deliberately moving others to the mental background (Ott and Eisenhardt 2020). The results support our theorizing, showing that cognitive simplicity is likely to benefit the proposed cognitive mechanisms and, in turn, promote the ability to focus sequentially on strategy domains. Because digital strategies are inherently dynamic (e.g., Bharadwaj et al. 2013a) and require frequent reformulation (e.g., Chanas et al. 2019), CEOs with high cognitive simplicity may be particularly successful in managing their challenges. While the abundant, fleeting opportunities of digitization can be challenging for some managers (e.g., Smith and Beretta 2021), cognitive simplicity may enable CEOs to prioritize opportunities and take swift action. A decisive CEO who sets a clear direction increases the rate of action-induced feedback and can be a success factor for digital strategy (e.g., Chanas et al. 2019). The cognitive capabilities of managers may amount to a critical dynamic managerial capability (e.g., Eggers and Kaplan 2013) for addressing the new leadership challenges posed by digital ecodynamics (e.g., Bharadwaj et al. 2013b).

Consistent with our second hypothesis, the results show a positive moderation effect of CEO overconfidence on the relationship between cognitive simplicity and digital strategy orientation. This finding suggests that CEO overconfidence modifies the proposed underlying mechanisms of cognitive control and cognitive change. Consistent with propositions from management scholars (e.g., Hiller and Hambrick 2005) and behavioral researchers (e.g., Schumacher et al. 2020), overconfidence increases cognitive control and limits cognitive switching. The cognitive bias promotes cognitive simplification processes and helps the CEO navigate the vast opportunity space of digital strategies. Thus, our findings indicate that managerial overconfidence can be a critical contingency in information systems research that evaluates top executives’ information processing.

The present study contributes to scholarly research on managerial cognitive ability and digital strategy in at least three important ways. First, we advance the concept of cognitive simplicity and introduce processes through which CEOs use it to manifest strategic orientation. We show that it is a positive characteristic, helping CEOs to be proactive and focused. In this way, we address an important research gap in the information systems literature, as cognition has been predominantly studied in terms of its relevance for the design and use of technology (e.g., Benbasat and Taylor 1978). Second, we examine the affect of a significant bias on managers’ cognitive processes and offer a nuanced view of cognition and strategizing. Our study contributes by suggesting a holistic view of cognitive models. Third, we contribute to the understanding of advantageous management characteristics for risky, complex, and unfamiliar strategy directions such as digital strategy.

Our study has important implications for managers. First, to increase a firm’s digital strategy orientation, the CEO must be aware of how their cognitive processes influence their decision-making behavior. Second, firms should pay special attention to the CEO’s cognitive processes and biases to promote areas related to digital strategy, such as the scope of digital technology, digital capabilities, digital ecosystem coordination, and digital architecture configuration. CEOs with high cognitive simplicity and overconfidence are especially likely to be able to cope with the demands of a digital ecosystem. To promote digital strategy, firms may want to populate the top management team with executives who display these characteristics.

Naturally, our study has several limitations that represent opportunities for future research. First, our study focuses on the CEO’s cognitive simplicity, but other managerial characteristics must also influence a firm’s digital strategy orientation. For example, Gerstner et al. (2013) show that CEO narcissism affects a firm’s technology adoption. Second, the data used in this study is limited to publicly listed firms in the S&P 1500. Thus, we encourage future researchers to test how generalizable our findings are, for instance, using samples of smaller firms and firms in other countries. Third, our dependent variable relies on the firms’ written representations in their 10-K filings, which might not capture their actual behavior. For instance, firms might intentionally present themselves in a favorable light to attract investors (e.g., Lehavy et al. 2011). Future researchers should substantiate our findings using primary data, such as in-depth interviews.

Research Prospect

The main idea of this study is that the CEO's cognitive simplicity is positively related to the firm's digital strategy orientation. In addition to rigorously developing our hypotheses, we will further substantiate our analysis through the following four steps. First, to substantiate the results based on quarterly conference calls and 10-Ks, additional firm-level outcomes are to be included in the analysis. Preliminary results based on measures of overall strategic change (e.g., Bednar et al. 2013, Crossland et al. 2014) look promising. Second, other proxies for manager-level overconfidence (e.g., Malmendier and Tate's 2015 "Longholder") will be tested to check the robustness of Hypothesis 2. As we continue to explore Hypothesis 2, we will control for excessive optimism at the manager level, as this concept is closely related to overconfidence, and a distinction should be made (e.g., Schrand and Zechman 2012). Third, we will rerun all models controlling for all Big Five personality traits, following Harrison et al. (2019), to check for the effect of different personalities. Initial analyses based on a smaller sample (Standard & Poor's 500) look promising. Finally, we will continue our search for appropriate instrumental variables to predict cognitive simplicity, eventually moving our analysis to a two-stage least squares (2SLS) regression.

Conclusion

Digital strategy is increasingly emerging as a topic in conversations among academics and practitioners (e.g., Hanelt et al. 2020). Due to its strategic importance, digital strategy affects and challenges managers in all industries and contexts. The challenges around the COVID 19 pandemic have shown that many organizations are lagging in the area of digitalization and need to significantly increase their digital strategy orientation. Our study indicates that manager cognition can support this process, and identifies useful characteristics in one of the key decision-makers who can advance a firm's digital strategy orientation. The results suggest that CEOs can use cognitive simplicity to navigate the vast opportunity space of increasingly complex and chaotic digital ecodynamics and position the firm to achieve a sustainable competitive advantage through an appropriate digital strategy (e.g., Bharadwaj et al. 2013a).

	(1)	(2)	(3)
	Linear Model	Linear Model with Moderator	Interaction Model
Cognitive Simplicity	0.00090** (0.00036)	0.00089** (0.00036)	0.00061* (0.00037)
CEO Overconfidence		-0.00038 (0.00049)	-0.00036 (0.00049)
Cognitive Simplicity x CEO Overconfidence			0.00073** (0.00036)
Controls	Included	Included	Included
Firm Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Constant	0.12765 (0.17019)	0.12664 (0.16935)	0.12520 (0.16970)
R ²	0.1194	0.1212	0.1233
F	321.32***	303.94***	296.15***

Notes: N= 9,061. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Controls are not shown for brevity. Standard errors are in parentheses. Standard errors are robust and clustered by firm. Unstandardized coefficients are used except for variables included in interactions. The dependent variable is Digital Strategy Orientation in the given year. All continuous variables are winsorized at 1%.

Table 1. Regression Results

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