



# Informal institutions and absorptive capacity: A cross-country meta-analytic study

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## Abstract

The informal institutions construct has not been well understood in prior research. We contribute to the informal institutions literature by developing a generalized two-by-two conceptualization of institutions that juxtapose the dimension of behavioral uncertainty versus environmental uncertainty and the dimension of informal institutions versus formal institutions. In particular, we theorize informal institutions based on the extent to which they reduce behavioral uncertainty or environmental uncertainty, as well as their alignment with the formal institutional environment with respect to the two types of uncertainty. Leveraging this fourfold typology, we shed new light on the importance of informal institutional conditions in theories of firms' absorptive capacity and performance. Using a cross-country meta-analytical approach, we find that a firm's absorptive capacity is more positively related to performance outcomes in countries with informal institutions that reduce behavioral uncertainty and environmental uncertainty. Furthermore, the misalignment between informal and formal institutions with respect to behavioral uncertainty and environmental uncertainty weakens the relationship between absorptive capacity and performance outcomes. Overall, by re-emphasizing the fundamental role of informal institutions in reducing behavioral and environmental uncertainties, our typology offers a fine-grained perspective to conceptualize informal institutions and constitutes an opportunity to advance theory in informal institutions and international business.

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## INTRODUCTION

While much attention has been paid to formal institutions (e.g., Chacar, Newburry, & Vissa, 2010; Dau, 2013; Li & Qian, 2013), considerably less attention has been given to informal institutions in international business research (Sartor & Beamish, 2014). Whereas formal institutions typically include written rules (e.g., laws and regulations) and are enforced by the state or government bodies (e.g., police or courts), informal institutions consist of unwritten rules (e.g., norms of behavior and codes of conduct) and are self-enforced by ordinary people within the institutions



(Helmke & Levitsky, 2004; North, 1990; Pejovich, 1999). Indeed, informal institutions are “more primary and deep-seated than formal institutions” in regulating organizational activities (Crossland & Hambrick, 2011: 800). Yet, the informal institutions construct has not been well conceptualized and incorporated into mainstream institutional studies (Estrin & Prevezer, 2011). For example, scholars have used culture measures (e.g., Holmes, Miller, Hitt, & Salmador, 2013)<sup>1</sup> or study-specific indicators (e.g., Galang, 2012; Tonoyan, Strohmeyer, Habib, & Perlitz, 2010) to capture this concept.

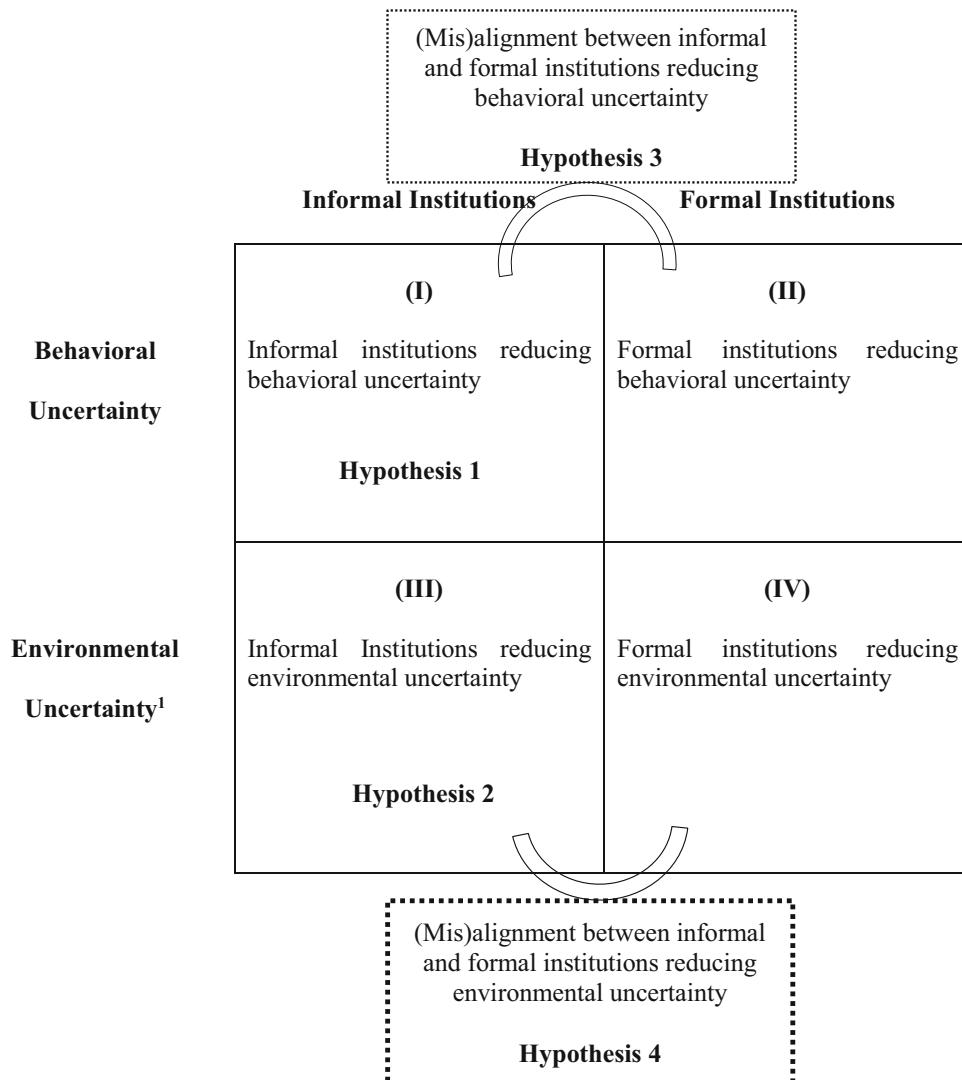
In this study, we first advance a generalized fourfold conceptualization of informal and formal institutions. In particular, we draw upon an uncertainty-based conceptualization of informal institutions (Sartor & Beamish, 2014; Williamson, 1985) and categorize institutions based on whether they mainly reduce behavioral uncertainty or environmental uncertainty. Indeed, the major role of institutions in society is to “reduce *uncertainty* by establishing a stable...structure to human interaction” (North, 1990: 6). According to Williamson (1985), uncertainty can be conceptualized in terms of behavioral uncertainty and environmental uncertainty. Whereas behavioral uncertainty results from the possibility of “strategic non-disclosure, disguise, or distortion of information” by exchange partners, environmental uncertainty concerns an organization’s inability to predict and comprehend the external environment (Williamson, 1985: 57). Juxtaposing the dimension of behavioral versus environmental uncertainty (Williamson, 1985) and the dimension of informal versus formal institutions (North, 1990), we advance a framework consisting of four types of institutional factors.

We then apply these typologies to explore the role of informal institutions in organizational innovation and knowledge management processes, which require substantial interactions among market participants (Nonaka, 1994; Tallman & Chacar, 2011) and thereby incur considerable uncertainties (Sartor & Beamish, 2014; Williamson, 1985). In particular, scholars of organizational innovation ubiquitously emphasize the importance of absorptive capacity (e.g., Mowery & Oxley, 1995), which is defined as a firm’s capability to acquire, assimilate, and use new knowledge for strategic purposes (Cohen & Levinthal, 1990). These scholars implicitly assume that organizational investment in absorptive capacity generates positive payoffs

invariably across societies, implying that the knowledge outcomes of firms’ absorptive capacity are indifferent to the informal institutional contexts where these firms reside. Yet empirical studies reveal conflicting findings: absorptive capacity does not generate value and may even lead to negative payoffs in some contexts (e.g., Chinaprayoon, 2012; Moon, Mariadoss, & Johnson, 2019). Our study shines its light on this unexamined assumption and asks: *how do informal institutions in society alter the relationship of a firm’s investment in absorptive capacity and improvements in its knowledge, innovation, and eventually performance?*<sup>2</sup>

To answer our question, we highlight reducing behavioral and environmental uncertainty as the mechanisms whereby informal institutions facilitate the conversion from a firm’s absorptive capacity to its performance outcomes. We maintain that informal institutions that mitigate behavioral and environmental uncertainty may strengthen the relationships between absorptive capacity and performance outcomes. We also submit that the misalignment between informal and formal institutions with respect to behavioral uncertainty and environmental uncertainty may undermine the outcomes of absorptive capacities. We use meta-regression analyses based on a sample of 130 independent studies involving 66,266 firms across 20 countries. This approach allows us to integrate all studies that were conducted in individual countries and systematically examine how informal institutions act as contingencies for the relationships between firm absorptive capacity and performance outcomes.

Our study aims to advance prior research in two specific ways. First, we enrich the informal institutions literature by advancing a generalized fourfold framework of institutions. Our efforts complement extant typologies of informal institutions (e.g., Duran, van Essen, Heugens, Kostova, & Peng, 2019; Helmke & Levitsky, 2004; Sartor & Beamish, 2014) and may constitute an opportunity to advance institutional theory (Vergne, 2011). Second, we shed new light on the importance of informal institutional conditions in reducing behavioral and environmental uncertainty to theories of firms’ absorptive capacity and performance (e.g., Lewin, Massini, & Peeters, 2011). We therefore reconcile the conflicting findings in the prior literature that organizational investment in absorptive capacity generates divergent payoffs across societies.



**Figure 1** A typology of informal and formal institutions.

## THEORY AND HYPOTHESES

### Informal Institutions: A Fourfold Conceptualization

Our typologies of informal and formal institutions are based on two dimensions. Figure 1 presents our framework. The first dimension highlights whether the major role of institutions is to reduce *behavioral* or *environmental uncertainty* (Williamson, 1985). Scholars in international business have identified these two distinct types of uncertainty in affecting organizational decision-making, such as entry modes (Sartor & Beamish, 2018) and strategic alliances (Krishnan, Geyskens, & Steenkamp, 2016). Extending this line of research into studies of innovation and absorptive capacity, we suggest

that both types of uncertainty emerge during knowledge processes. One typical type of behavioral uncertainty relates to opportunism, that is, “self-interest seeking with guile” (Williamson, 1985: 47). For example, opportunistic knowledge exchange partners may hold knowledge hostage as leverage for fulfilling a particular demand or appropriate the knowledge to pursue their self-interests. Opportunistic partners may also shirk their responsibilities in knowledge co-creation and free ride on their exchange partners’ efforts, further burdening and utilizing the resources of other firms. Following prior research on innovation and absorptive capacity, we focus on the technological side of environmental uncertainty, that is, an organization’s inability to fully predict and comprehend the



technological environment (Sartor & Beamish, 2014; Song & Montoya-Weiss, 2001). One example of (technological) environmental uncertainty is the inability to access and acquire relevant knowledge in the technological environment. For example, external knowledge search does not occur in a vacuum, and “institutional contexts where a firm is embedded will affect the availability of the information as well as how a firm accesses the information or knowledge, and thus will determine the firm’s search cost” (Li, Zhang, & Lyles, 2013: 402). The two types of uncertainty precipitate divergent organizational costs in absorptive capacity and knowledge processes. Whereas behavioral uncertainty often increases the costs associated with monitoring opportunistic knowledge exchange partners (Dyer, 1997), technological environmental uncertainty is expected to increase the information costs related to an organization’s effort to access necessary knowledge (Atuahene-Gima & Li, 2004; Sartor & Beamish, 2014). Therefore, it is imperative to differentiate between these two types of uncertainty (e.g., Krishnan et al., 2016; Sartor & Beamish, 2018).

The second dimension concerns the categorization of *formal versus informal institutions* (North, 1990). These two dimensions together produce our fourfold typology shown in Fig. 1. *Informal institutions reducing behavioral uncertainty* refer to the norms, values, and beliefs to reduce behavioral uncertainty about exchange partners. For example, prior research suggests that strong firm ethical norms and the credibility of managers may reduce the likelihood of opportunistic behaviors (Dikova, Sahib, & Van Witteloostuijn, 2010; Parkhe, 1998; Sartor & Beamish, 2014). *Formal institutions reducing behavioral uncertainty* refer to the regulations and laws that reduce behavioral uncertainty about exchange partners. For instance, the efficiency and quality of regulations and laws to enforce contracts may mitigate opportunistic motives (Acemoglu & Johnson, 2005; Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2003; Lobsiger & Zahner, 2012). *Informal institutions reducing (technological) environmental uncertainty* refer to the norms, values, and beliefs to reduce technological uncertainty by promoting technological development. For example, norms of technological cooperation between firms (Hagedoorn, 1993) and inter-organizational knowledge transfer activities (Grant & Baden-Fuller, 2004) may stimulate technological development. *Formal institutions reducing (technological) environmental uncertainty* refer to the regulations

and laws that reduce technological uncertainty by promoting technological development and protecting technological invention. For instance, regulations that support the development of technologies and laws that protect the patents of new technologies reduce technological uncertainty (Oxley, 1999; Todorova & Durisin, 2007; Zahra & George, 2002). In summary, our framework is rooted in the classic work of transaction cost economics (Williamson, 1985) and institutional research (North, 1990), and it could be potentially generalized to inform future institutional research.

### Absorptive Capacity

Cohen and Levinthal posit the concept of absorptive capacity and suggest that it is “a critical component of innovative capabilities” (1990: 128). Because of its importance in knowledge management and innovation, absorptive capacity emerges as a crucial concept in prior research (e.g., Lyles & Salk, 1996; Minbaeva, Pedersen, Björkman, Fey, & Park, 2003). The idea that absorptive capacity creates value, however, has not found universal support. For example, a firm’s absorptive capacity is not significantly associated with the success of new products in a study of private firms in the U.K. (Moon et al., 2019), or it is negatively related to product innovation output in a study in Thailand (Chinaprayoon, 2012).

The observed inconsistency in absorptive capacity–performance relationships indicate that achieving and applying absorptive capacity may not come without a cost, which could be related to high levels of uncertainty in the absorptive capacity processes (Volberda, Foss, & Lyles, 2010). As criticized by Volberda et al. (2010: 947), “there is little consideration in the literature of the cost of developing absorptive capacity … or in some way taking advantage of an organization’s absorptive capacity.” Li et al. (2013) also specifically note that the extant absorptive capacity research extols the benefits of absorptive capacity and overlooks uncertainties and the corresponding costs in the absorptive capacity processes. Yet, prior research has not examined, either conceptually or empirically, the role of informal institutions in explaining the divergent absorptive capacity–performance links (Lewin, Massini, & Peeters, 2011). As a result, we know little about how informal institutions in society may help reduce uncertainties and govern costs incurred during social interactions in the firm’s absorptive capacity processes. In the next sections, we link our fourfold framework of



informal institutions to absorptive capacities, by elaborating on the mechanisms through which informal institutions affect the conversion from firm absorptive capacity to performance.

### Informal Institutions and Absorptive Capacity

Our main prediction is that informal institutions in a society, as “the sets of habits, rules, norms ...that regulate the relations and interactions between actors (people, organizations, etc.)” (Lewin et al., 2011: 93), may reduce behavioral and environmental uncertainties incurred during absorptive capacity processes. We link informal institutions and absorptive capacity research together because innovation is predominantly interactive, involves high levels of uncertainty, and therefore becomes “a socially embedded process which cannot be understood without taking into consideration its institutional and cultural contexts” (Lundvall, 1992: 1). For example, the social interactionist perspective on organizational learning maintains that “learning occurs, and knowledge is created, mainly through conversations and interactions” between participants (Easterby-Smith, Crossan, & Nicolini, 2000: 787; Tallman & Chacar, 2011). These interactions are even more important when strategic knowledge is tacit, ambiguous, or complex (Dhanaraj, Lyles, Steensma, & Tihanyi, 2004; Easterby-Smith, Lyles, & Tsang, 2008; Reed & Defillippi, 1990). By providing the “rules of the game” for different forms of interactions involved in absorptive capacity processes, informal institutions provide a unique perspective to understand absorptive capacity.

To facilitate hypotheses development, we apply the process-based model of absorptive capacity (Lane, Koka, & Pathak, 2006) and disaggregate the link from absorptive capacity to performance outcomes into three inter-related processes (i.e., knowledge acquisition, knowledge assimilation, and knowledge exploitation). Below we discuss how informal institutions reduce behavioral and environmental uncertainty and associated costs in these processes and thus alter the relationship between absorptive capacity and performance outcomes.

#### Informal institutions reducing behavioral uncertainty

Following a prior exemplar study (Sartor & Beamish, 2014), we use strong firm ethical norms and credibility of managers to depict informal institutions reducing behavioral uncertainty, which thereby facilitate the conversion from a firm’s

absorptive capacity to its performance. A society’s ethical standards of business conduct and credibility of managers contribute to the prevailing informal institutional environment (Dikova et al., 2010). Firm ethical norms define what constitutes right or wrong business conduct in society, thereby reducing behavioral uncertainty about exchange partners (Sartor & Beamish, 2014). In the words of Douglass North, “effective traditions of hard work, honesty, and integrity simply lower the costs of transacting and make possible complex, productive exchange” (1990: 138). Prior research provides robust evidence that firm ethical norms differ across national institutional environments, contributing to variations in organizational decision-making and outcomes (e.g., Hofstede, Van Deusen, Mueller, & Charles 2002). For the credibility of managers, prior research has shown its salutary role in improving various aspects of corporate governance practices and reducing behavioral uncertainty associated with exchange partners (e.g., Chan & Cheung, 2008; Sartor & Beamish, 2014). Such credibility, built upon constantly adhering to ethical norms, constrains firms to behaviors that will not jeopardize their accumulated credible reputation, which is difficult to rectify once it is compromised (Parkhe, 1998).

Informal institutional environments with strong firm ethical norms and credibility of managers reduce behavioral uncertainty and costs in various absorptive capacity processes. First, in the knowledge acquisition processes where the focal firm recognizes and evaluates external knowledge, high firm moral standards and reputation of managers decrease behavioral uncertainty about the external knowledge owner. The focal firm is more likely to trust the credible knowledge owner, mitigating the focal firm’s costs associated with information verification or even additional search costs for alternative sources of knowledge. Second, in the knowledge assimilation process where firms often share knowledge with others, strong firm ethical standards and credibility of managers reduce behavioral uncertainty about the knowledge recipients. The knowledge owner is more willing to share the knowledge with others (Noooteboom, 2002; Platteau, 1994) because the knowledge recipient has a lower propensity of leaking sensitive knowledge to competitors, which alleviates the knowledge owner’s costs of monitoring and safeguarding from unwanted knowledge spillover (Casimir, Lee, & Loon, 2012). Third, in the knowledge exploitation process, which often requires



extensive collaborations, strong firm ethical norms and reputation of managers mitigate behavioral uncertainty about knowledge exchange partners as well. A reassurance of firm moral standards is often needed to minimize free-riding, bridge the differences, navigate through uncertain situations, and in turn, reduce the costs of knowledge combination and application (Nooteboom, 2000).

In contrast, weak firm ethical norms and low credibility of managers in society drastically increase behavioral uncertainty during absorptive capacity processes (e.g., incurring additional knowledge search and validation costs and increasing the need for enacting costly mechanisms to monitor exchange partners and protect proprietary information) (Williamson, 1985). As a result, under this institutional condition, it is less likely for a firm to successfully convert absorptive capacity to actual improvements in innovation and performance even when the firm possesses higher absorptive capacity. We hypothesize that:

**Hypothesis 1:** Informal institutional environments reducing behavioral uncertainty strengthen the relationship between a firm's absorptive capacity and its performance outcomes.

#### *Informal institutions reducing (technological) environmental uncertainty*

We then suggest that informal institutions that support technological cooperation and knowledge transfer reduce environmental uncertainty related to technological development and strengthen the absorptive capacity–performance relationship. Informal institutions that support technological cooperation and knowledge transfer capture “the degree to which technologically focused constituents in the host country’s private and public sectors are engaged in activities designed to facilitate the development, transfer, and growth of knowledge and technology...” (Sartor & Beamish, 2014: 1079). Prior research finds that the extent of technological cooperation and knowledge transfer varies across national institutional environments (Sartor & Beamish, 2014), which encourages “a reflective learning environment which provides benefits through the mutual transfer of knowledge and perhaps transaction cost minimization” (Morrison & Mezentseff, 1997: 352).

In absorptive capacity processes, informal institutions that support technological cooperation and knowledge transfer reduce environmental

uncertainty, consequently strengthening the absorptive capacity–performance link. First, in the knowledge acquisition process, frequent technological cooperation and knowledge transfer reduce environmental uncertainty and knowledge search costs. Increased cooperation and transfer allow a focal firm to learn from various knowledge exchange partners who may be familiar with the technological environment and have access to knowledge that can be acquired by the firm (Lundvall, 2007). Technological cooperation and transfer also stimulate the development of new technologies and precipitate technological spillovers in society (D’Este & Patel, 2007; Hagedoorn, 1993). These factors enhance the availability of technological knowledge in the environment, thereby reducing environmental uncertainty related to technological development (Sartor & Beamish, 2014). Second, informal institutions that emphasize technological cooperation and knowledge transfer enhance the knowledge assimilation process. The knowledge critical for a firm to survive and thrive in uncertain environments is often tacit and difficult to assimilate (Nonaka & Konno, 1998). High levels of interactions during technological cooperation and transfer can strengthen relational embeddedness between exchange partners, fostering the assimilation of tacit knowledge (Dhanaraj et al., 2004; Makhija & Ganesh, 1997). Finally, informal institutions that support technological cooperation and knowledge transfer improve the knowledge exploitation process. The knowledge exploitation process itself is innately comprised of iterations of successes and failures, with each iteration generating a cost for the firm, especially in uncertain technological environments. Extensive technological cooperation and knowledge transfer in an institutional context may reduce the time and cost to exploit new knowledge by combining exchange partners’ stores of existing knowledge and experience (Brown & Eisenhardt, 1995).

In contrast, informal institutions that do not support technological cooperation and knowledge transfer increase (technological) environmental uncertainty, which may heighten the costs associated with understanding the nature of the technological environment (i.e., high knowledge search costs) (Li et al., 2013), the costs of assimilating (Dhanaraj et al., 2004; Makhija & Ganesh, 1997) and utilizing external knowledge (Brown &



Eisenhardt, 1995). As a result, firms are less likely to benefit from their absorptive capacity. We hypothesize that:

**Hypothesis 2:** Informal institutional environments reducing (technological) environmental uncertainty strengthen the relationship between a firm's absorptive capacity and its performance outcomes.

#### ***Misalignment between informal institutions and formal institutions reducing behavioral uncertainty***

Departing from prior research that advocates a simple distinction between a society's informal and formal institutions (Helmke & Levitsky, 2004; Williamson, 2009), we offer a nuanced understanding of the relationship by categorizing formal and informal institutions based on the behavioral versus environmental uncertainty dimension. We explore the misalignment between informal and formal institutions reducing behavioral uncertainty and environmental uncertainty, respectively.

We suggest that the misalignment between informal and formal institutions reducing behavioral uncertainty negatively moderates the relationship between absorptive capacity and performance outcomes. An alignment in reducing behavioral uncertainty is achieved when a society establishes both well-developed laws in enforcing contracts (formal institutions reducing behavioral uncertainty) and high levels of firm ethical norms and managerial credibility (informal institutions reducing behavioral uncertainty). In this society, informal institutions serve as the foundation of formal institutions to reduce behavioral uncertainty, strengthening incentives to conform to formal rules that might otherwise exist merely on paper (Helmke & Levitsky, 2004). For example, the effectiveness of the U.S. Constitution is largely contingent on the shared ethical values among citizens (North, Summerhill, & Weingast, 2000). Increasing institutional alignment reduces "the gap between what is legal and what is legitimate," further decreasing behavioral uncertainty associated with what accepted means/ends are (Webb, Tihanyi, Ireland, & Sirmon, 2009: 498). As an outcome of this alignment, low levels of behavioral uncertainty facilitate knowledge processes and then enhance the likelihood to convert firm absorptive capacity to innovation and other performance outcomes.

In contrast, in societies with institutional misalignment concerning behavioral uncertainty, informal institutions create incentives in ways that are incompatible with the formal rules: to follow one rule, actors must violate another. The most familiar examples of incongruence are often found in postcolonial contexts in which formal institutions were imposed on indigenous informal rules and particularistic informal institutions such as corruption (Collins, 2002). Witt and Lewin (2007) contend that institutional misalignment is economically costly to firms. The authors explain that while aligned institutional structures can provide an economic advantage for firms to exploit their resources, this advantage diminishes or even disappears with increased institutional misalignment. Institutional misalignment amplifies uncertainties and transaction costs for firms due to confusion regarding which set of institutions to conform (Eesley, Eberhart, Skousen, & Cheng, 2018). High levels of behavioral uncertainty, as an outcome of the incompatibility between formal and informal rules, heighten the barriers to various absorptive capacity processes and reduce the likelihood of firms to benefit from their absorptive capacities by increasing transaction costs associated with knowledge processes. Therefore, we hypothesize that:

**Hypothesis 3:** The misalignment between informal institutions and formal institutions reducing behavioral uncertainty weakens the relationship between a firm's absorptive capacity and its performance outcomes.

#### ***Misalignment between informal institutions and formal institutions reducing (technological) environmental uncertainty***

Similarly, we explore the misalignment between informal and formal institutions reducing (technological) environmental uncertainty. Conceptually, such alignment in (technological) environmental uncertainty is reflected in a society with both developed regulations to promote technological development (formal institutions reducing environmental uncertainty) and strong technological cooperation and transfer practices between organizations (informal institutions reducing environmental uncertainty). In this context, informal institutions play a key role in making the formal rules of the game more effective (Helmke & Levitsky, 2004). Increasing institutional alignment further reduces environmental uncertainty related to technological



development, by minimizing the gap between what is legal and what is legitimate and acceptable by the norm (cf. Webb et al., 2009: 498). Low levels of environmental uncertainty reduce the information and production costs associated with securing the necessary knowledge (e.g., knowledge search costs) to understand the technological environment, benefiting organizational performance.

On the contrary, institutional misalignment regarding (technological) environmental uncertainty increases the costs of gaining information about the environment as well as assimilating and utilizing such information. Institutional misalignment makes it difficult for firms to take advantage of developed and supportive government technological policies, as well as technological cooperation for innovative activities (Wu, Wang, Hong, Piperopoulos, & Zhuo, 2016). Misalignment of institutions reducing environmental uncertainty poses difficulties for firms that need to respond to changing technological environments. For example, a technological cooperation arrangement may become strained, or the innovation developed from technological cooperation may become obsolete, if government regulations fail to support such arrangements and new technologies (Witt & Lewin, 2007). Furthermore, firms may risk losing technological legitimacy and profitability when exploiting a technology that is strongly supported by government policies, but highly criticized by society at large, as was the case with agricultural biogas technology in Germany (Markard, Wirth, & Truffer, 2016). Institutional misalignment increases uncertainty and transaction costs in the technological environment, dampening the conversion from a firm's absorptive capacity to its improvement in innovation and performance. We hypothesize that:

**Hypothesis 4:** The misalignment between informal institutions and formal institutions reducing (technological) environmental uncertainty weakens the relationship between a firm's absorptive capacity and its performance outcomes.

## METHOD

### Literature Search

We implemented different approaches to identify studies to be included in this meta-analysis. First, we searched for articles published through April 2019 in Business Source Premier, Google Scholar,

ISI Web of Science, and PsycINFO databases using "absorptive capacity" as the search term. Second, to supplement the electronic search, we conducted a manual search of 21 peer-reviewed management journals that regularly publish empirical research on absorptive capacity such as the *Academy of Management Journal*, *Administrative Science Quarterly*, *Journal of International Business Studies*, *Journal of Management*, *Management Science*, *Organizational Science*, *Research Policy*, and *Strategic Management Journal*. Third, we checked the reference lists of recent reviews on absorptive capacity (e.g., Song, Gnyawali, Srivastava, & Asgari, 2018; Volberda et al., 2010; Zou, Ertug, & George, 2018) and the articles citing seminal work of absorptive capacity (Cohen & Levinthal, 1990) through Google Scholar. Moreover, we used the same search term to search ProQuest Digital Dissertations and conference programs from the Academy of Management, INFORMS, and Strategic Management Society in the past nine years (from 2011 to 2019). We also searched Social Science Research Network (SSRN) for working papers and unpublished studies on this topic.

### Inclusion Criteria

Consistent with prior research using meta-analyses (e.g., Jiang, Lepak, Hu, & Baer, 2012), we used the following criteria to include studies in our sample. First, we included empirical studies examining absorptive capacity at the unit level of analysis (e.g., firms or business units) and excluded those focusing on absorptive capacity at the observation level (e.g., Corredoira & Rosenkopf, 2010). Second, we only included studies that provided correlation coefficients (i.e.,  $r$  values) or other information that could be used to estimate the relationships between absorptive capacity and variables reflecting firm performance (e.g., innovation and financial performance). We excluded empirical studies from the coding process that did not provide such information (e.g., Ziedonis, 2007). Third, an empirical study had to report the sample size for us to calculate the sample size-weighted effect sizes. Fourth, when a study used two or more independent samples, we coded the independent samples separately (e.g., Chang, Chen, & Lin, 2014). Based on these inclusion criteria, we obtained a sample of 66,266 firms from 130 independent samples across 20 countries.<sup>3</sup> Web Appendices 1 and 2 list our coding sheet as well as all coded studies in this meta-analysis.<sup>4</sup>



## Variables

We followed Lipsey and Wilson's (2001) approach to create a coding scheme including sample information (e.g., sample size and the country origin of the sample), key variables, reliabilities of variables, and correlations among variables. We made further adjustments to the coding sheet after all authors coded a random sample of ten articles and discussed disagreements. By using the updated coding scheme, one author and a research assistant coded all articles and reached an agreement rate of 95% of all coded information. Then, the two coders checked the primary studies and resolved disagreements.

## Absorptive capacity

The identified studies measured absorptive capacity in two primary ways. Some studies assessed absorptive capacity by using objective measures, such as R&D intensity (e.g., Tsai, 2001), and the percentage of professional and technical personnel within the total number of employees (e.g., Luo, 1997). Other empirical studies measured absorptive capacity by using subjective scales, such as the scale developed by Jansen, Van Den Bosch, and Volberda (2005). As prior research used both approaches to measure absorptive capacity, we included both in our study. Consistent with prior meta-analytical studies (e.g., Karna, Richter, & Riesenkampff, 2016), we used a dummy variable to indicate the subjective and objective approaches in the weighted meta-regression analyses.

## Firm performance

Following Zahra and George (2002), we measured firm performance as a composite concept consisting of various aspects of firm performance. In the identified empirical studies, we followed prior meta-analytical studies and coded firm performance outcomes into five categories, including innovation, knowledge management, operational performance, financial performance, and overall organizational performance (e.g., Jiang et al., 2012). First, innovation refers to new and useful changes to an organization's existing products and processes. Innovation has been regarded as one of the most important outcomes pertaining to a firm's competitive advantage (Barney, 1991) and has been heavily studied in prior absorptive capacity research (e.g., Rakthin, 2013; Rothaermel & Alexandre, 2009). Second, knowledge management refers to firm activities or processes related to knowledge creation and development, such as technology

exploration (Laursen, Leone, & Torrisi, 2010). Third, operational performance relates to firm product and operational success. It was measured by using both objective indicators such as the ratio between sales revenue and total investment (Luo, 1997) and subjective indicators such as work efficiency (Weigelt & Sakar, 2012), market effectiveness (Engelen, Kube, Schmidt, & Flatten, 2014), product performance (Jones, Lanctot, & Teegen, 2001), and customer satisfaction (Griffith and Sawyer 2010). Fourth, financial performance refers to the financial health of an organization over a given time period. In the identified studies, it was measured as return on assets (Zhang, Zhong, & Makino, 2015), return on equity (Chang, Gong, & Peng, 2012), return on investment (Tsai, 2001), and subjective financial performance (Wang, Senaratne, & Rafiq, 2015). Finally, overall organizational performance includes other performance indicators, such as the overall effectiveness of an organization (Fernhaber & Patel, 2012).<sup>5</sup> Following prior research (e.g., Jiang et al., 2012), we included all five categories of variables to reflect firm performance, and used four dummy variables to indicate different types of variables in the weighted meta-regression analyses reported below.

## Informal institutions and misalignment

In this study, we propose informal institutions operate as key moderators of the relationship between firm absorptive capacity and performance. To measure these moderators, we first coded the country where the study was conducted (e.g., Australia, China, Spain, and the U.S.), and then we referred to public sources to find the data to measure these variables. In particular, we obtained measures from several data sources: IMD World Competitiveness Yearbook, WEF Global Competitiveness Index, and World Bank Ease of Doing Business Index. These datasets collect survey data from randomly selected executives on their opinions with respect to firm practices and the institutions that prevail in various countries. Scholars, journalists, and international organizations frequently use these datasets to measure national institutional environments (e.g., Acemoglu & Johnson, 2005; Sartor & Beamish, 2014).

We measured informal institutions based on the scales developed by Sartor and Beamish (2014) and assessed internal consistency (scale reliability) according to Fornell and Larcker's (1981) measure. In particular, we measured informal institutions reducing behavioral uncertainty by "Ethical



practices are implemented in companies", and "Credibility of managers in society is strong" (Dikova et al., 2010; Parkhe 1998; Sartor & Beamish, 2014). The Cronbach's  $\alpha$  for this variable was 0.72, exceeding the 0.70 guideline required to establish internal consistency (Nunnally & Bernstein, 1994). We measured informal institutions reducing (technological) environmental uncertainty by "Technological cooperation is prevalent between companies"; and "Knowledge transfer between companies and universities is prevalent" (Grant & Baden-Fuller, 2004; Hagedoorn, 1993; Sartor & Beamish, 2014). The Cronbach's  $\alpha$  for this variable was 0.97, exceeding the 0.70 guideline as well.

To measure the misalignment between informal institutions and formal institutions reducing behavioral uncertainty and environmental uncertainty, we first evaluated a country's formal institutions reducing behavioral uncertainty and (technological) environmental uncertainty. Following prior research (Acemoglu & Johnson, 2005; Djankov et al., 2003), we measured formal institutions reducing behavioral uncertainty by the World Bank's Ease of Doing Business "enforcing contracts" subindex. This subindex assessed two aspects of laws and regulations governing contracts among market partners: the efficiency for resolving commercial disputes through a local court, and the quality of judicial processes in the country. Originally developed by Djankov et al. (2003), this measure has been frequently used in previous studies (e.g., Acemoglu & Johnson, 2005; Lobsiger and Zahner 2012). We measured formal institutions reducing (technological) environmental uncertainty by items indicating the degree to which a country's legal system promotes the development of technology and protects the invention of technology: "Development and application of technology are supported by the legal environment", and "patents and intellectual property rights are enforced by the law in the country" (Oxley, 1999; Todorova & Durisin, 2007). The Cronbach's  $\alpha$  for this variable was 0.86.

We then used a few approaches to capture the misalignment between formal and informal institutions reducing behavioral (or environmental) uncertainty. First, following Williamson (2009), we created ratio variables to measure the relative strength of informal versus formal institutions. Specifically, we created a ratio variable, that is equal to the informal institutional score divided by the formal institutional score about behavioral (or

environmental) uncertainty, and a ratio variable that is equal to the formal institutional score divided by the informal institutional score about behavioral (or environmental) uncertainty. The use of the ratio is limited by some cases in which the formal or informal institutional scores equal zero.<sup>6</sup> Therefore, we used other approaches to measure the misalignment of formal and informal institutions. Second, following Casciaro and Piskorski (2005), we calculated the absolute value of the difference between the formal and informal institutional scores regarding behavioral (or environmental) uncertainty. The use of the absolute value of the difference is not subject to limitations of zero-value scores (Casciaro & Piskorski, 2005). The higher the absolute value of the difference, the larger the misalignment between formal and informal institutions. Third, we created interactions between formal and informal institutions, and entered the interaction term along with the main informal and formal indices in the regression to test the effect of alignment between informal and formal institutions. We used the absolute value of the difference between formal and informal indices in the main regression, and used the other two approaches in robustness checks. We found consistent support of our hypothesis of institutional misalignment using all three approaches.

### Meta-analytic Calculation and Hypothesis Testing Procedures

We followed Schmidt and Hunter's (2015) approach to estimate the relationships between firm absorptive capacity and performance outcomes. For variables measured using perceptual scales, we adopted internal reliability (i.e., Cronbach's alpha) to correct for the measurement error of the observed correlations. We used an imputation procedure based on the average weighted reliability from other identified studies when the reliability information was not reported. We also corrected for sampling error to calculate the average sample size-weighted mean correlations ( $\bar{r}$ ) and weighted mean correlations corrected for measurement error ( $\bar{\rho}$ ) between absorptive capacity and performance outcomes. When a single primary study provided multiple effect sizes for the same relationship, we used Hunter and Schmidt's (2004: 435–439) formula to create a composite effect size for each relationship within a single study. We also calculated the 95% confidence interval (CI) around  $\bar{\rho}$  and the 80% credibility interval (CR) of  $\rho$ . A 95% CI excluding zero indicates that a corrected



correlation is statistically significant at the level of 0.05 ( $p < 0.05$ ). An 80% CR for a positive correlation excluding zero indicates that at least 90% of the individual correlations included in the meta-analysis are positive. Finally, we calculated the percentage of variance of observed relationships accounted for by statistical artifacts for the corrected correlation (%V). A low percentage is indicative of potential moderator variables.

Since our hypotheses focus on the moderating effects of informal institutions on the relationship between a firm's absorptive capacity and its performance, we used the proposed moderators as predictors of the corrected correlations between a firm's absorptive capacity and its performance outcomes in weighted meta-regression models. As we operationalized the proposed moderators at the country level, and coded the effect sizes at the study level, we conducted multilevel meta-regression analyses by using the "metafor" Package for R written by Viechtbauer (2019). According to the recent review by Gonzalez-Mulé and Aguinis (2018) and Oh (2020), meta-regression has become an integral part of mainstream research in business and management journals. Compared with traditional subgroup analyses of examining moderators of a relationship, meta-regression analyses can use the full information of all potential moderators and control for the influence of all other moderators (e.g., types of absorptive capacity and performance outcomes) to examine whether a moderator (e.g., informal institutions) has a unique impact on effect size (e.g., the relationship between absorptive capacity and performance outcomes) net of other moderators. Moreover, most of the previous meta-analyses using the meta-regression approach simply assigned the higher-level (e.g., country-level) moderators to the lower-level (e.g., study-level) of the effect sizes, which would violate the independence assumption in regression analyses. We adopted a multilevel meta-regression approach to address this concern. We thus provided more rigorous estimations of the moderating effects of informal institutions on the relationship between absorptive capacity and performance outcomes. Our approach is consistent with recent multilevel meta-analyses examining national-level moderators for study-level relationships (e.g., Taras, Kirkman, & Steel, 2010).

Specifically, we used a multilevel random-effects model by placing the study-level effect size and control variables at the lower level and including the country-level moderators at the higher level. As

one example, the equations corresponding to the model examining the moderating effect of informal institutions reducing behavioral uncertainty are listed such that  $j$  represents studies, and  $k$  represents countries,  $z_{jk}$  is the corrected correlation between absorptive capacity and a performance outcome,  $U_{jk}$  is the lower-level variance,  $\beta_{0k}$  is the lower-level intercept,  $\beta_1$  to  $\beta_7$  are regression coefficients for lower-level control variables,  $V_{0k}$  is the higher-level variance,  $\gamma_{00}$  is the higher-level intercept, and  $\gamma_1$  is the regression coefficient of the higher-level predictor variable (i.e. informal institutions reducing behavioral uncertainty). At the lower level, we controlled for types of absorptive capacity measures (1 = subjective measure, 0 = objective measure); types of firm performance measures (1 = subjective measure, 0 = objective measure or mixed measure including both subjective and objective information); publication status (1 = published work, 0 = unpublished work); and four dummy variables representing innovation, knowledge management, operational performance, and financial performance to show the robustness of the moderating results. The statistical significance of  $\gamma_1$  tests our hypothesis on the extent to which higher-level (country-level) variables (e.g., informal institutions reducing behavioral uncertainty) moderate the magnitude of firm absorptive capacity–performance correlations ( $z_{jk}$ ).

Lower-level model:

$$\begin{aligned} z_{jk} = & \beta_{0k} + \beta_1 \text{ Type of AC measures}_{jk} \\ & + \beta_2 \text{ Type of performance measure}_{jk} \\ & + \beta_3 \text{ Publication status}_{jk} + \beta_4 \text{ Innovation (dummy)}_{jk} \\ & + \beta_5 \text{ Knowledge management (dummy)}_{jk} \\ & + \beta_6 \text{ Operational performance (dummy)}_{jk} \\ & + \beta_7 \text{ Financial performance (dummy)}_{jk} + U_{jk} \end{aligned}$$

Higher-level model (example):

$$\beta_{0k} = \gamma_{00} + \gamma_1 \text{ Informal institutions reducing behavioral uncertainty} + V_{0k}.$$

## RESULTS

Table 1 summarizes the overall relationships between absorptive capacity and the five categories of performance outcomes. As we can see, across all the studies that have been meta-analyzed, absorptive capacity has statistically significant and positive relationships with all five types of performance

**Table 1** Meta-analytic correlations between absorptive capacity and firm performance.

Variables	<i>k</i>	<i>N</i>	$\bar{r}$	$SD_r$	$\bar{\rho}$	$SD_{\rho}$	80% CR	95% CI	% Var
Innovation	70	40,234	0.27	0.22	0.28	0.25	–0.04:0.59	0.22:0.34	4.01
Knowledge management	18	9433	0.30	0.22	0.30	0.24	–0.01:0.61	0.17:0.42	3.59
Operational performance	11	1903	0.52	0.26	0.57	0.32	0.16:0.99	0.28:0.86	3.39
Financial performance	39	17,513	0.30	0.23	0.32	0.25	0.00:0.63	0.23:0.41	6.97
Overall organizational performance	21	3890	0.34	0.23	0.39	0.27	0.04:0.73	0.26:0.51	6.91

*k* is the number of correlations summarized; *N* is the total sample size across samples;  $\bar{r}$  is the sample-size-weighted mean observed correlation;  $SD_r$  is the standard deviation of observed correlations across studies;  $\bar{\rho}$  is the weighted mean correlation corrected for measurement error;  $SD_{\rho}$  is the standard deviation of corrected correlations. 80% CRs is the 80% credibility interval for  $\rho$ ; 95% CIs is the 95% confidence interval around the corrected mean correlation  $\bar{\rho}$ ; % Var is the percent of variance attributable to sampling error and measurement error.

**Table 2** Weighted meta-regressions for moderating effects of informal institutions on the relationship between absorptive capacity and performance.

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	B (SE)	p	B (SE)	p	B (SE)	p	B (SE)	p	B (SE)	p
Constant	0.133 (0.103)	0.199	–0.476 (0.307)	0.124	–0.239 (0.192)	0.215	0.173 (0.115)	0.137	0.318 (0.141)	0.026
<i>Moderators and controls</i>										
Type of absorptive capacity measures <sup>a</sup>	0.197 (0.060)	0.001	0.193 (0.059)	0.002	0.195 (0.059)	0.001	0.198 (0.060)	0.001	0.208 (0.059)	0.001
Type of performance measures <sup>b</sup>	0.179 (0.056)	0.002	0.184 (0.056)	0.001	0.187 (0.056)	0.001	0.182 (0.056)	0.002	0.183 (0.056)	0.001
Innovation	0.078 (0.070)	0.268	0.092 (0.072)	0.199	0.094 (0.071)	0.188	0.091 (0.072)	0.209	0.098 (0.072)	0.172
Knowledge management	–0.001 (0.080)	0.989	0.014 (0.083)	0.862	0.020 (0.081)	0.811	0.006 (0.082)	0.940	0.025 (0.082)	0.766
Operational performance	–0.002 (0.101)	0.983	–0.004 (0.102)	0.970	0.002 (0.102)	0.989	0.001 (0.103)	0.993	0.002 (0.102)	0.983
Financial performance	–0.002 (0.075)	0.979	0.005 (0.077)	0.951	0.007 (0.076)	0.932	0.001 (0.077)	0.899	0.017 (0.077)	0.827
Publication status <sup>c</sup>	–0.005 (0.062)	0.929	0.005 (0.063)	0.939	0.008 (0.062)	0.894	0.006 (0.063)	0.926	0.026 (0.062)	0.676
<i>Informal institution moderators</i>										
Informal institutions reducing behavior uncertainty (H1)		0.092 (0.048)		0.046						
Informal institutions reducing environmental uncertainty (H2)					0.072 (0.034)	0.037				
Misalignment between informal institutions and formal institutions reducing behavior uncertainty (H3)							–0.078 (0.047)	0.099		
Misalignment between informal institutions and formal institutions reducing environmental uncertainty (H4)									–0.131 (0.057)	0.022
Residual Variance (study level)	0.041		0.041		0.040		0.041		0.041	
Residual Variance (country level)	0.016		0.013		0.014		0.013		0.010	

Unstandardized regression coefficients are presented with standard errors in parentheses. Exact values of *p* are reported. *k* is the total number of effect size.

<sup>a</sup> For type of absorptive capacity measures, 1 = subjective, 0 = objective.

<sup>b</sup> For type of performance measures, 1 = subjective, 0 = objective or mixed.

<sup>c</sup> For publication status, 1 = published journal articles, 0 = unpublished dissertations, master theses, conference papers, and working papers.



indicators, suggesting the critical role of absorptive capacity in promoting firm outcomes as suggested by prior wisdom (e.g., Cohen & Levinthal, 1990; Volberda et al., 2010).

Since our hypotheses focus on the moderating effects of components of national informal institutions on the relationships between a firm's absorptive capacity and its performance, we focus on the multilevel meta-regression analysis results. As shown in Model 1 of Table 2, we first control for the type of absorptive capacity measures and the type of firm performance measures, and find that the type of absorptive capacity measures is positively and significantly related to the relationships between absorptive capacity and firm performance ( $B = 0.197$ ,  $SE = 0.060$ ,  $p = 0.001$ ), suggesting that the absorptive capacity–performance link is stronger for studies that use the subjective and survey-type of absorptive capacity measures than those using objective absorptive capacity measures. Moreover, the absorptive capacity–performance link is stronger for subjective measures of firm performance as compared to objective or mixed measures ( $B = 0.179$ ,  $SE = 0.056$ ,  $p = 0.002$ ). To further illustrate how the type of absorptive capacity and the type of performance measures moderate the relationships between absorptive capacity and outcome variables, we conducted subgroup analyses by calculating and comparing the weighted corrected correlations of subgroups of each moderator and presented the results in Web Appendix 3.<sup>7</sup>

After including the control variables, as shown in Model 2 of Table 2, we find that informal institutions reducing behavioral uncertainty is positively and significantly related to the corrected correlation between absorptive capacity and firm performance ( $B = 0.092$ ,  $SE = 0.046$ ,  $p = 0.048$ ). Therefore, Hypothesis 1 is supported. In Model 3 of Table 2, we find that informal institutions reducing (technological) environmental uncertainty is positively and significantly associated with the corrected absorptive capacity–performance relationship ( $B = 0.072$ ,  $SE = 0.034$ ,  $p = 0.037$ ). Thus, we find support for Hypothesis 2. In Model 4 of Table 2, the misalignment between informal institutions and formal institutions reducing behavioral uncertainty is negatively related to the corrected absorptive capacity–performance relationship ( $B = -0.078$ ,  $SE = 0.047$ ,  $p = 0.099$ ), marginally supporting Hypothesis 3. In Model 5 of Table 2, the misalignment between informal institutions and formal institutions reducing (technological) environmental uncertainty has a significantly

negative relationship with the corrected absorptive capacity–performance link ( $B = -0.131$ ,  $SE = 0.057$ ,  $p = 0.022$ ), supporting Hypothesis 4.

### Supplementary Analysis

We also evaluated the misalignment between informal and formal institutions in other quadrants. In reference to Fig. 1, misalignment between cell (I), informal institutions reducing behavioral uncertainty, and cell (IV), formal institutions reducing (technological) environmental uncertainty, is negatively but insignificantly related to the corrected absorptive capacity–performance relationship ( $B = -0.091$ ,  $SE = 0.108$ ,  $p = 0.397$ ). Misalignment between cell (II), informal institutions reducing behavioral uncertainty, and cell (III), formal institutions reducing (technological) environmental uncertainty also has an insignificantly negative relationship with the corrected absorptive capacity–performance link ( $B = -0.037$ ,  $SE = 0.037$ ,  $p = 0.315$ ). The result further emphasizes the importance of differentiating between behavioral uncertainty and environmental uncertainty in informal institutions. Misalignment is more severe when informal institutions and formal institutions produce divergent expectations related to the same type of uncertainty.

## DISCUSSION

In this study, we advance a generalized fourfold conceptualization of institutions. Building on this more fine-grained conceptualization of informal institutions, we explore the role of informal institutions in the absorptive capacity research. We find that firms embedded in countries with informal institutions reducing behavioral uncertainty and (technological) environmental uncertainty will benefit more from their investment in absorptive capacity. The misalignment between informal and formal institutions will dampen the conversion from firm absorptive capacity to positive outcomes. Overall, this uncertainty-based conceptualization of informal institutions promises to advance research in informal institutions and international business.

### Contributions

Our study contributes to the research on informal institutions by developing a two-by-two typology of institutional factors that juxtapose the dimension of behavioral versus environmental



uncertainty (Sartor & Beamish, 2014; Williamson, 1985) and the dimension of informal versus formal institutions (North, 1990). In particular, we conceptualize informal institutions based on the extent to which they reduce behavioral or environmental uncertainty, as well as their alignment with the formal institutional environment with respect to the two types of uncertainty. By re-emphasizing the fundamental role of informal institutions in reducing uncertainties (North, 1990), our uncertainty-based fourfold framework offers a fine-grained perspective to conceptualize informal institutions. Furthermore, our framework allows us to decompose institutional misalignment into behavioral and environmental uncertainty-related categories, providing a tool to examine the effects of different types of institutional misalignment separately. Our study thus differs from most of the existing institutional studies that either use culture measures (e.g., Holmes et al., 2013) or study-specific indicators (e.g., Galang, 2012; Tonoyan et al., 2010) to capture informal institutions. This theory-driven conceptualization provides an opportunity to integrate the construct of informal institutions into mainstream strategy research and international business studies (Estrin & Prevezer, 2011).

Our study sheds new light on absorptive capacity research, by bringing this fourfold informal institutions conceptualization into the research on the effectiveness of absorptive capacity. Our study addresses the research question: how do informal institutions in a country affect the link from a firm's absorptive capacity to its performance? While absorptive capacity emerges as a critical concept in strategic management and international business research in driving learning and innovation at the firm level (Cohen & Levinthal, 1990) and the national level (Mowery & Oxley, 1995), prior research has mostly adopted a decontextualized perspective (assuming that this notion is applicable universally across all institutional contexts), which limits our understanding of the absorptive capacity concept. Our meta-analytical approach is the first attempt to show that country-level informal institutions that encourage firm ethical norms and technological cooperation and align with formal institutions amplify the relationships between absorptive capacity and firm performance. Further, our study helps potentially reconcile the inconclusive findings in the extant absorptive capacity literature. Indeed, absorptive capacity may be more beneficial for firms in certain countries, but less beneficial in others given the

variance in institutional contexts. Such findings enable us to develop a more precise assessment of the influence of absorptive capacity, a prominent concept in management and international business research.

Our study constitutes an opportunity for future theory development. Efforts to establish a more fine-grained conceptualization of an existing construct may offer a base for theory advancement (Suddaby, 2010). Our refined conceptualization of informal institutions suggests future research avenues in strategy and international business. Multinational firms may use diverse strategies to respond to informal institutional environments concerning different types of uncertainty. For example, in international partnership relationships, multinational firms may adopt strategies to stabilize such relationships through formal contracts and/or informal relational arrangement (Faems, Janssens, Madhok, & Looy, 2008; Luo, 2002). Are firms inclined to develop relational arrangements with local partners in informal institutional environments characterized with high levels of behavioral uncertainty? Relational norms may reduce the likelihood of opportunistic behaviors of partners. In contrast, do firms intend to craft detailed contracts to deal with informal institutions characterized with high levels of environmental uncertainty? It also remains interesting to explore whether the interplay among the four quadrants in our two-by-two framework may affect the adoption and effectiveness of contractual and relational arrangements.

Similarly, future research may set out to explore whether the adoption and effectiveness of other international business strategies, such as staffing strategies (home or host country nationals) (Chung, Park, Lee, Kim, 2015), may vary according to informal institutional environments regarding different types of uncertainty. For example, are multinational firms likely to exert more control over the subsidiary by assigning expatriates in response to informal institutions with high levels of behavioral uncertainty? Multinational firms may pursue increased control over its subsidiary investments in an attempt to lower transaction costs associated with opportunism (Brouthers & Brouthers, 2003). On the contrary, are multinational firms likely to assign host country nationals in the foreign subsidiaries to deal with informal institutional environments with high levels of environmental uncertainty? Firms may employ host country nationals to comprehend the



uncertain environments, as host country nationals can help firms gain access to valuable information and knowledge in the host country. Moreover, how do informal institutions reducing behavioral uncertainty and those reducing environmental uncertainty interact in affecting the adoption and effectiveness of such strategies? As such, the application of our typology of informal institutions generates many research questions and further advances the strategic management and international business fields.

### Managerial and Policy Implications

While our study uses absorptive capacity as a research context, our findings may be generalized to provide implications on cross-national or international knowledge management and innovation in general. Informal institutions are of particular importance in the advent of globalization which increases the prominence of emerging markets, where informal institutions play a more pronounced role in structuring interactions (Peng & Heath, 1996). We propose that informal institutions that emphasize firm ethical norms and technological cooperation are more likely to facilitate the translation from investment in firm absorptive capacity to positive performance outcomes. As such, in developing a firm's multinational strategies, it is imperative for managers to identify host countries with informal institutions that may be instrumental for absorptive capacity in particular and innovation and development in general. Also, our research carries policy implications. That is, our study shows that informal institutions could be a critical element of national innovation systems that may drive national innovation and benefit technological development and commercialization in a country (Nelson, 1993).

**Study Limitations and Future Research Directions**  
While we show that there is a meaningful linkage between informal institutions research and absorptive capacity, our study has several limitations. First, different measures of absorptive capacity and imprecise information from some empirical studies included in the meta-analysis may affect the precision of our findings (Hunter & Schmidt, 1990). For example, some studies use subjective measures of absorptive capacity and performance, and may use the same informant to evaluate both absorptive capacity and performance. This approach may overestimate the correlations between absorptive capacity and performance. Although we try to deal

with this issue by controlling for the type of absorptive capacity measures in the moderation tests, the common method variance remains a potential source of concern. Future studies that collect information on absorptive capacity and performance from different sources are encouraged.

Second, our meta-analysis has limitations in that we cannot directly examine the main effects of informal institutions on absorptive capacity. A meta-analysis synthesizes the relationship between two variables rather than examines either variable of a relationship. In our analyses, we examine how informal institutions moderate the relationship between a firm's absorptive capacity and its performance outcomes. In this case, the dependent variable of the analysis is the effect sizes of the absorptive capacity–performance relationship (e.g., corrected correlation  $r$ ) and the independent variables are the informal institutions and the control variables. This empirical design does not allow us to test the main effects of informal institutions on absorptive capacity. Moreover, similar to other meta-analyses (e.g., Watts, Steele, & Den Hartog, 2020), our empirical design cannot establish a causal link between absorptive capacity and performance, as the effect sizes used in this study are correlations and partial correlations reported in the prior studies. Future studies may identify better data sources that can complement the current research and mitigate the limitations of meta-analysis.

Third, we follow Williamson (2009) to capture the interplay between formal and informal institutions. Future research may explore more precise measures of formal-informal institutional interactions. For example, Helmke and Levitsky (2004) categorize formal-informal institutional interactions into four types, complementary, accommodating, competing, and substitutive, based on two dimensions. The first dimension is the degree to which formal and informal institutional outcomes converge, and the second dimension is the effectiveness of the relevant formal institution. More studies that examine the four types promise to enrich our understanding of the interactions between formal and informal institutions. We thus anticipate more sophisticated econometric and theory development that achieves greater levels of research rigor and managerial relevance in the next generation of research in the international business field.



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## NOTES

<sup>1</sup>Following the suggestions from the special issue editors, we treat informal institutions and culture as distinct concepts. While culture "is the deeper level of basic assumptions and beliefs" (Schein, 1985: 6–7; Hofstede, 1980), informal institutions are the actual unwritten rules and norms of behavior (North, 1990, 2005).

<sup>2</sup>In recognizing that firms are shown to have high levels of investment in absorptive capacities in some economies and yet continue to lag in innovation outcomes and performance, the more important concern is the extent to which a society's institutional contexts shape the outcomes of such investment in absorptive capacity. Therefore, we go beyond an understanding of how informal institutions shape the *level* of absorptive capacity to examine how informal institutions shape the *outcomes* of absorptive capacity.

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<sup>3</sup>Based on one anonymous reviewer's suggestion, we only focused on domestic firms in our meta-analysis to increase the validity of our conclusions. Our full data showed that the majority of the empirical studies in the prior absorptive capacity research were about domestic firms (88%) and only 12% were about multinational firms.

<sup>4</sup>Appendices are available online.

<sup>5</sup>In this study, we are interested in how, in general, institutions play a role in affecting the absorptive capacity and firm performance link. Therefore, we do not report how institutions may affect absorptive capacity and specific firm outcomes in the analyses. Additionally, the sample sizes are not large enough to examine the moderating hypotheses based on each of the five performance categories. However, we tested how institutions affect each of the five performance categories, and these results are available upon request.

<sup>6</sup>Adding a constant to the ratio variable to address the issue would have defeated the purpose, because doing so removes the ratio character of the measure.

<sup>7</sup>Appendices are available online.



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