

Organization Science

Publication details, including instructions for authors and subscription information:
<http://pubsonline.informs.org>

Avoiding High Opportunism Is Easy, Achieving Low Opportunism Is Not: A QCA Study on Curbing Opportunism in Buyer-Supplier Relationships

Thomas Mellewigt, Glenn Hoetker, Martina Lütkevitte

To cite this article:

Thomas Mellewigt, Glenn Hoetker, Martina Lütkevitte (2018) Avoiding High Opportunism Is Easy, Achieving Low Opportunism Is Not: A QCA Study on Curbing Opportunism in Buyer-Supplier Relationships. *Organization Science* 29(6):1208-1228. <https://doi.org/10.1287/orsc.2018.1227>

Full terms and conditions of use: <https://pubsonline.informs.org/Publications/Librarians-Portal/PubsOnLine-Terms-and-Conditions>

This article may be used only for the purposes of research, teaching, and/or private study. Commercial use or systematic downloading (by robots or other automatic processes) is prohibited without explicit Publisher approval, unless otherwise noted. For more information, contact permissions@informs.org.

The Publisher does not warrant or guarantee the article's accuracy, completeness, merchantability, fitness for a particular purpose, or non-infringement. Descriptions of, or references to, products or publications, or inclusion of an advertisement in this article, neither constitutes nor implies a guarantee, endorsement, or support of claims made of that product, publication, or service.

Copyright © 2018, INFORMS

Please scroll down for article—it is on subsequent pages



With 12,500 members from nearly 90 countries, INFORMS is the largest international association of operations research (O.R.) and analytics professionals and students. INFORMS provides unique networking and learning opportunities for individual professionals, and organizations of all types and sizes, to better understand and use O.R. and analytics tools and methods to transform strategic visions and achieve better outcomes.

For more information on INFORMS, its publications, membership, or meetings visit <http://www.informs.org>

Avoiding High Opportunism Is Easy, Achieving Low Opportunism Is Not: A QCA Study on Curbing Opportunism in Buyer–Supplier Relationships

Thomas Mellewigt,^a Glenn Hoetker,^b Martina Lütkewitt^a

^aDepartment of Management, Freie Universität Berlin, 14195 Berlin, Germany; ^bMelbourne Business School, University of Melbourne, Carlton, Victoria 3053, Australia

Contact: thomas.mellewigt@fu-berlin.de,  <https://orcid.org/0000-0002-9113-464X> (TM); glenn.hoetker@mbs.edu,  <http://orcid.org/0000-0001-8956-9452> (GH); martina.luetkewitte@gmail.com (ML)

Received: July 24, 2014

Revised: June 26, 2016; August 30, 2017;
December 22, 2017; April 26, 2018

Accepted: April 28, 2018

Published Online in Articles in Advance:
October 24, 2018

<https://doi.org/10.1287/orsc.2018.1227>

Copyright: © 2018 INFORMS

Abstract. Past research on how opportunism in buyer-supplier relationships can be mitigated remains incomplete and often contradictory. Applying recent advances in qualitative comparative analysis to a sample of 137 buyer-supplier relationships in the German automotive industry, we show that there are multiple equifinal pathways to high and low opportunism. In general, our study shows that it is easier to avoid high opportunism than to consistently achieve low opportunism. On this basis, we offer new insights into countering opportunism for researchers and managers. Achieving low opportunism requires a combination of governance mechanisms, which are generally not interchangeable. In particular, relational governance mechanisms in isolation seem to be more restricted than prior research has suggested but form a powerful synergistic combination with complex contracts. Although formal governance mechanisms lack enforceability, the coordination and monitoring that they provide are critical in both avoiding high opportunism and achieving low opportunism. Performance ambiguity is especially difficult to manage. Overall, our paper shows the power of configurational approaches and encourages the development of new theory that adopts a situational contingency perspective.

Supplemental Material: The online appendix is available at <https://doi.org/10.1287/orsc.2018.1227>.

Keywords: opportunism • transaction hazards • governance mechanisms • fuzzy set QCA

Introduction

There is broad consensus that opportunistic behavior imposes costs and lowers performance (Dahlstrom and Nygaard 1999, Luo 2007). Nevertheless, our understanding of how to mitigate opportunism in relationships (that is, the link between transaction hazards, governance mechanisms, and the opportunism that occurs over the life of the relationship) remains limited and often contradictory (Reuer and Ariño 2002, Macher and Richman 2008). For example, some studies have shown that contracts are effective at reducing opportunism (Dahlstrom and Nygaard 1999, Luo 2007), whereas others find no significant effect (Deeds and Hill 1998). The same holds true for other governance mechanisms.

A growing body of literature has attempted to address these inconsistencies by arguing that governance mechanisms are not effective or ineffective at preventing opportunism per se but rather, that their effectiveness depends on both how well they match the individual or combination of transaction hazards present and which other governance mechanisms are also

used (Williamson 1985, Poppo and Zenger 2002, Carson et al. 2006). Recent research has provided significant insights, but our understanding remains incomplete (Schepker et al. 2014).

Many relationships are imbued with multiple hazards. In response, firms can deploy multiple governance mechanisms. However, the interactive nature of both transaction hazards and governance mechanisms noted above means that one cannot simply cumulate the best responses to the individual hazards. Knowing that governance mechanisms 1 and 2 are the best responses to hazards A and B, respectively, does not mean that combining 1 and 2 is the best response to a transaction featuring A and B. The combination of A and B may pose hazards that neither do in isolation. Mechanisms 1 and 2 may be mutually incompatible or ill suited to handle the hazards caused by the combination of A and B. The complex and highly contingent nature of relationships among hazards and governance mechanism is, we believe, a substantial barrier to the field's ability to address the theoretical and managerial challenges of mitigating opportunism.

We take advantage of recent advances in the application of qualitative comparative analysis (QCA) to large-*N* situations to overcome this barrier (Ragin and Fiss 2008, Fiss et al. 2013, Greckhamer et al. 2013). QCA, which has diffused into management from its roots in political science and sociology, is distinct as both a research paradigm and a data analytical technique (Fiss 2007, Wagemann and Schneider 2010, Fiss 2011). As opposed to regression techniques, which seek to isolate the independent net effects of competing explanatory variables, QCA uses set-theoretic logic to focus on the combined effects of causal conditions (Ragin 1987). Doing so allows for more complex causal reasoning (Ragin 1987, Rihoux 2003, Greckhamer et al. 2008).

In particular, it allows the researcher to propose and test hypotheses involving “conjunctural causation,” which means that the effect of a condition (here, a transaction hazard or governance mechanism) on an outcome (the degree of opportunism) may vary according to the other conditions that it co-occurs with. Additionally, multiple configurations (i.e., combinations of conditions) may lead to the same outcome (*equifinality*). Lastly, asymmetric hypotheses are easily incorporated. One can hypothesize that the presence of a certain condition is associated with an outcome (e.g., high opportunism) without implying that the absence of that condition will necessarily lead to the opposite outcome, the so-called nonoutcome, namely low opportunism.

We use these features of QCA to develop hypotheses relating different combinations of transaction hazards and governance mechanisms to the degree of opportunism experienced in buyer-supplier relationships. Responding to the call of Masten and Saussier (2002) for more case-like studies of governance, we then extend our analysis by returning to QCA’s roots as an exploratory technique, identifying and theoretically interpreting the configurations (i.e., combinations of conditions) that we find to be consistently associated with low or high opportunism. Because QCA requires focusing on a fairly small number of conditions, we conclude our analysis by examining the conjunction of the configurations with other factors suggested by the literature. In this way, we combine what Greckhamer et al. (2013, p. 49) called “the two QCAs”: the first complementing regression analysis as a means of hypotheses testing and the second complementing qualitative analysis as a tool for exploratory analysis.

From this background, we make four primary contributions. First, this is the first paper that applies QCA to the domain of opportunism in buyer-supplier relationships to our knowledge. Important insights from doing so include that achieving low opportunism is more challenging than avoiding high opportunism. In general, achieving low opportunism requires the use of

at least two governance mechanisms, with the third mechanism as a peripheral component. In addition, we extend prior research by showing that there are multiple equifinal pathways to high and low opportunism. Second, relational governance mechanisms in isolation seem more restricted than their proponents have suggested but form a powerful synergistic combination with complex contracts. Third, complex contracts play an important role in avoiding high opportunism and are part of the solution for low opportunism. This might explain why prior research with their focus on the impact of single governance mechanisms came to mixed empirical results regarding their effect on opportunism. Fourth, although formal governance mechanisms lack enforceability, the coordination and monitoring that they provide are critical in both avoiding high opportunism and achieving low opportunism.

Theory and Hypotheses

Transaction Hazards

We develop our hypotheses on the foundation of transaction cost economics (TCE), which examines the nature of exchange relationships with transactions as the unit of analysis and a focus on the costs associated with them (Williamson 1975, 1985). TCE is based on two central behavioral assumptions: opportunism and bounded rationality. Opportunism refers to “self-interest seeking with guile” (Williamson 1985, p. 44) and can include “lying, stealing, and cheating” as well as the “incomplete or distorted disclosure of information . . . to mislead, distort, disguise, obfuscate, or otherwise confuse” the partner (Williamson 1985, p. 47). TCE assumes that opportunism is neither omnipresent nor rare (Wathne and Heide 2000), suggesting that firms should organize their transaction assuming that their exchange partners are “potentially opportunistic” (Joshi and Stump 1999a, p. 294). In doing so, however, they must confront the bounds of managerial rationality. It is impossible to predict all possible contingencies that should be addressed when organizing the governance of a transaction, and partners may act opportunistically in hopes that their behavior will not be detected (Macher and Richman 2008).

Transactions are burdened with high potential opportunism when they are characterized by factors that either limit the firm’s ability to neutralize attempted opportunism on the part of their partner or increase the likelihood of unpredicted (or unpredictable) contingencies, which creates the occasion for opportunistic behavior. We will consider three of the most prominent transaction hazards in TCE: transaction-specific investments, technological uncertainty, and performance ambiguity (Williamson 1985, Poppo and Zenger 2002, Carson et al. 2006).

Transaction-specific investments are tied to a particular exchange relationship and of much lesser or no value in their second best uses (Williamson 1985, Mayer 2009). The resulting quasirents render a firm vulnerable to opportunistic behavior when it makes a transaction-specific investment (Das and Rahman 2010). The partner could, for instance, create a hold-up situation and use the focal firm's dependence on it to its favor (Mayer 2009). Despite this risk, partners to an exchange often invest specifically to raise the efficiency of the collaboration and generate value, because assets that are tailored to the specific relationship are more efficient than generalized assets (Das and Rahman 2010).

Uncertainty refers to the focal firm not being able to accurately predict the behavior of its exchange partner or the evolution of the environment because of unexpected or frequent changes in technology and market conditions (Noordewier et al. 1990). Higher uncertainty increases transaction costs for the parties involved, because information processing may be more complex or more monitoring may be required (Luo 2007). We specifically examine technological uncertainty, which describes difficulties in foreseeing the technological developments and requirements in the relationship (Walker and Weber 1984, Geyskens et al. 2006). Technological uncertainty increases the need for coordinated adaptation in the face of unanticipated technical developments (Poppo and Zenger 1998), while raising the risk of a chosen technological approach proving suboptimal over time (Balakrishnan and Wernerfelt 1986).

Performance ambiguity describes a situation in which a company is unable to evaluate the quality of the good or service received from its exchange partner (Heide 1994). It can occur because of difficulties in measurement (Barzel 1982) or the nonseparability of effort across actors (Alchian and Demsetz 1972). Ambiguity increases the likelihood of opportunistic behavior, because partners anticipate that their behavior is less likely to be noticed (Ouchi 1980, Carson et al. 2006). At the same time, the risk of acts being incorrectly sanctioned as opportunistic reduces incentives for cooperation (Carson et al. 2006).

Governance Mechanisms

Firms can deploy a wide variety of governance mechanisms in an attempt to mitigate the risks posed by these transaction hazards. We focus in turn on three prominent ones in the recent literature: contracts of varying complexity, relational governance mechanisms, and formal governance mechanisms.¹ In developing our hypotheses, we consider the firm's need to balance competing concerns (i.e., the benefits and costs of governance). On the one hand, by using suitable governance mechanisms, alliance partners can minimize transaction costs (Williamson 1985, Joshi and Stump 1999a), "induce order, ... mitigate conflict

and realize mutual gain" (Macher and Richman 2008, p. 4). With effective governance mechanisms in place, partners are more confident in the relationship and each other (Williamson 1985). On the other hand, governance comes with the considerable costs (Williamson 1985, Luo 2006). Devising and implementing these governance mechanisms tie up resources that could otherwise be used elsewhere to the joint benefit of the alliance members (Wathne and Heide 2000, Das and Rahman 2002). Therefore, firms should avoid overgovernance and use the mechanisms that provide the required protection given the hazards present at the lowest cost (Williamson 1985, Lee and Cavusgil 2006).

Before developing hypotheses regarding the efficacy of governance mechanisms, we note that QCA invites and enables a different framing of hypotheses than multiple regression. Because regression coefficients reflect the degree to which a covariate will "increase or decrease the level or probability of an outcome, net of the effect of the other relevant causes" (Ragin 2000, p. 313), two assumptions are inherent in the regression paradigm: (a) if more of a covariate leads to a good outcome, less of it leads by an equal degree to a bad outcome and (b) if the sign of covariates x and z correlation with outcome y is the same, high levels of x can offset low levels of z and vice versa. Unsurprisingly, hypotheses embody these assumed relationships.

QCA makes no such assumptions. As we detail below, QCA applies set-theoretic concepts by first characterizing observed levels of each causal and outcome covariate as high or low² and then identifying combinations of characteristics that are associated with each focal outcome. Support for hypothesized relationships is evaluated primarily by observing whether the proportion of cases containing the hypothesized combination of causal variables that also yield the hypothesized outcome exceeds a predetermined threshold. Therefore, our hypotheses consider the *combined* effects of transaction hazards and governance mechanisms rather than their *net effect* as in the regression paradigm.

We begin by considering contractual complexity as a response to transaction hazards. A written contract is a prominent safeguard that companies use *ex ante* to clarify the rules of the game and protect their specific investments against opportunistic behavior (Carson et al. 2006). A contract typically contains agreements about each party's rights and obligations, roles, responsibilities, and performance expectations. Additionally, it details the alliance's goals and outcomes (Luo 2006), monitoring procedures, dispute resolution mechanisms, and penalties for contract violation (Poppo and Zenger 2002) as well as a specification of how to deal with future developments (Lee and Cavusgil 2006). The effectiveness of a contract is further backed up by its legal enforceability (Lee and

Cavusgil 2006, Luo 2006). Although contracts are a common feature in alliances, they vary considerably in their complexity. More complex contracts are able to specify each of these points in greater detail as well as address a wider range of potential contingencies (Argyres et al. 2007). This makes it harder to realize individual advantages at the expense of the partner and thus, limits the potential gains of opportunism (Das and Teng 2002).

Among potential hazards, the combination of high asset specificity and high technological uncertainty is frequently predicted to pose a substantial risk of opportunism (David and Han 2004). High technological uncertainty means that exchange partners cannot fully envision future developments, and the risky eventuality of needing to adapt to circumstances outside those originally envisioned is increased (Macher and Richman 2008). If no transaction-specific investments were in place, each company could simply abandon the relationship if problems occur, because generalized investments are still valuable in their second best use, and thus, continuity is not important (Williamson 1985). Given high asset specificity, however, terminating the current relationship and switching to a new partner would impose significant economic losses. A buyer who has made substantial transaction-specific investments is thus vulnerable to opportunistic actions by a supplier if unanticipated circumstances develop (Joshi and Stump 1999b). For example, supplier organizations in the automobile industry are able to achieve substantial economies of scale because of the production and supply of certain parts to multiple Original Equipment Manufacturers (OEMs). Consequently, the buyer organization adapts its production equipment to use these components (Stump and Heide 1996, Heide and John 1990). In addition, OEMs, like Toyota, undertake a huge amount of human asset-specific investments (Villena and Craighead 2017). As Bensaou and Anderson (1999) point out, “Creating an effective supply relationship for such a component requires the buyer to take the risk of creating assets that are specific to a supplier.” Furthermore, if uncertainty makes the supplier less confident of the future value of the alliance, the supplier’s motivation to resort to opportunism may increase (Luo 2006).

With their ability to specify how the partners will respond to contingencies backed by legal sanctions for violations, contracts offer a potential solution to the risk of opportunism. However, technological uncertainty makes it costly, difficult, or even impossible to specify appropriate contractual contingencies ex ante (Wathne and Heide 2000, Das and Rahman 2002, Geyskens et al. 2006). Attempting to do so risks producing contracts that are too static or inflexible to respond to rapid changes in technology (Carson et al. 2006, Lee and Cavusgil 2006). Conflicting views of the appropriate technological approach (Argyres 1995) will complicate both formulating

initial research and development plans (Armour and Teece 1980) and adapting those plans to developments that render the initial technical approach inappropriate (Masten 1984). Lastly, technological uncertainty makes it difficult for third parties, such as the courts, to determine fault in case of failure (Masten 1984), reducing the value of recourse to legal sanctions.

Accordingly, in situations characterized by high asset specificity and technological uncertainty, we would not expect a complex contract to suffice on its own to curb opportunism. Any feasible level of complexity inevitably leaves open many chances for opportunism. Hence, we propose the following hypothesis.

Hypothesis 1. *Under conditions of high asset specificity and high technological uncertainty, using a highly complex contract is associated with high opportunism unless it is accompanied by high levels of formal and/or relational governance mechanisms.*

It is useful to clarify exactly what we are and are not predicting. Because QCA is not bound to symmetric predictions about the level of opportunism being high or low, this is not a traditional directional hypothesis. We are not predicting that the combination of a highly complex contract and for example, high levels of formal governance will consistently lead to low opportunism in this situation. It does not rule out that possibility. Rather, it simply does not speak to it at all. Put in other words, a prediction that a complex contract used in isolation will consistently lead to a firm suffering high opportunism in this situation does not imply that high levels of both contractual complexity and formal governance mechanisms are sufficient for the firm to consistently achieve low opportunism. Likewise, our hypotheses address the co-occurrence of two transaction hazards—high asset specificity and high technological uncertainty—and imply nothing about configurations containing only one of them. For these reasons, our hypotheses do not correspond to a moderation hypothesis in the regression framework.

In contrast to technological uncertainty, high performance ambiguity poses a significant risk for opportunism regardless of the degree of asset specificity. Rather than hold up, which depends on the presence of transaction-specific investments, the primary threat is moral hazard, which is independent of asset specificity (Mayer 2009). A supplier can, for example, disguise lower quality of his products or shirk responsibilities, because this is hard or impossible to detect for the buyer (Barzel 1982, Demsetz 1988, Wathne and Heide 2000). Furthermore, difficulties in performance measurement exacerbate the problem of one party perceiving the other as contributing less to and/or getting more out of the relationship, inviting an opportunistic response (Das and Rahman 2010). As a result, high performance ambiguity reduces alliance partners’

commitment to the collaboration (Luo 2006), further increasing the probability of opportunistic actions (Carson et al. 2006). As we have learned through our interviews, because of decades of outsourcing in the automobile industry, knowledge is lost on the part of the buyer to appropriately judge the quality of the products. This is especially true for products with a high degree of intelligence (e.g., software). More thoroughly specifying standards and responsibilities has limited effectiveness when a firm is unable to accurately assess its partner's compliance with those standards (Poppo and Zenger 2002). More elaborated consequences, such as penalty clauses, mean less when the courts are unable to accurately assess whether a party met the contractual obligations of quality or effort. Hence, we predict the following hypothesis.

Hypothesis 2. *Under high performance ambiguity, the use of a highly complex contract is associated with high supplier opportunism unless it is accompanied with high levels of formal and/or relational governance mechanisms.*

We next consider formal governance mechanisms: depersonalized means of controlling and coordinating partner behavior and output in a relationship (Hoetker and Mellewigt 2009). Typical examples include budget plans, cost breakdown methods, and audit programs based on the evaluation of files, records, and reports (Crosno and Dahlstrom 2008, Hoetker and Mellewigt 2009).³

Formal governance mechanisms play an important role in supporting the smooth flow of information between firms. By improving transparency across the collaborating firms, they allow a firm to monitor its partner's behavior more closely and spot unusual incidents or dubious activities (Das and Rahman 2002). By supporting better coordination, they may allow the partners to preempt circumstances that could otherwise lead to an opportunistic breakdown of the relationship (Hoetker and Mellewigt 2009).

However, the lack of legal enforceability limits the effectiveness of formal governance mechanisms, meaning that they are likely not sufficient on their own to deter opportunistic behavior. Without the possibility of legal sanction or incentives to preserve the relationship, the risk of exposure is unlikely to constrain a partner's opportunism. Ease of coordination is less useful in preempting occasions of opportunism without something motivating the parties to apply it toward that goal.

However, formal governance mechanisms may beneficially complement other governance mechanisms. For example, the increased information flow that they provide can help monitor compliance with contractual terms (Poppo and Zhou 2013). Their contribution to better coordination may be more useful when paired with greater commitment to the relationship provided by relational governance mechanisms, which

we will discuss in detail below. Hence, we make the following predictions for formal governance mechanisms in isolation, addressing the same hazards as above, and examine their possible complementary role as part of our analysis.

Hypothesis 3. *Under high levels of buyer asset specificity and high technological uncertainty, high levels of formal governance mechanisms are associated with high supplier opportunism unless accompanied by high levels of relational governance mechanisms and/or contractual complexity.*

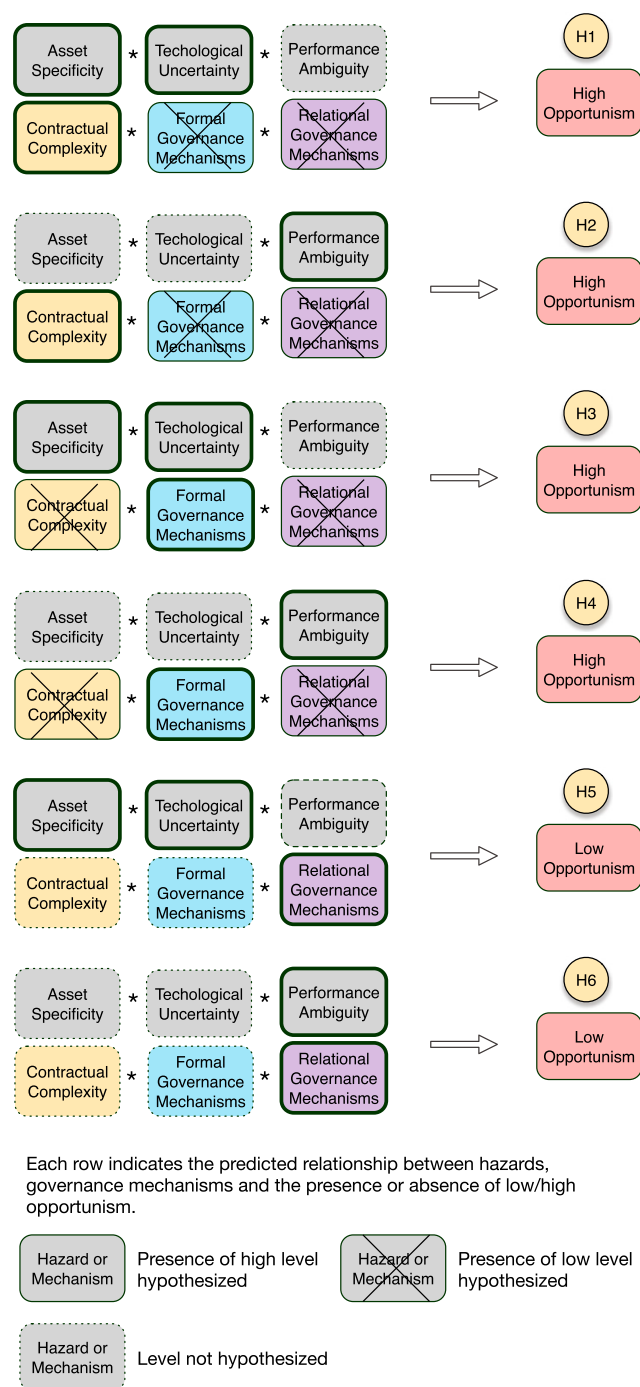
Hypothesis 4. *Under high performance ambiguity, high levels of formal governance mechanisms are associated with high supplier opportunism unless accompanied by high levels of relational governance mechanisms and/or contractual complexity.*

Lastly, we consider relational governance mechanisms, which enhance the building of trust and social identification through the interaction of individuals from the partner organizations (Martinez and Jarillo 1989, Dyer and Singh 1998). Typical examples are regular meetings or the formation of steering committees, both of which are based on the interaction of specific people in the collaborating companies and the establishment of a good personal relationship between them over time (Hoetker and Mellewigt 2009). These social-based means of control and coordination encourage open communication and information sharing (Poppo and Zenger 2002, Hoetker and Mellewigt 2009), which in turn, increases commitment to the alliance (Lee and Cavusgil 2006).

Although they lack the legal enforceability of a contract, relational governance mechanisms have significant advantages as a response to the combination of high asset specificity and high technological uncertainty. The close interaction of employees over time in a cross-company collaboration increases their personal attachment and social identification (Hoetker and Mellewigt 2009), builds a sense of common interest in persevering with the collaboration (Poppo and Zenger 2002), and encourages the parties to flexibly adapt to changing circumstances (Wathne and Heide 2000). Unlike contracts, relational governance mechanisms do not depend on prespecification of potential contingencies and can more flexibly adapt, remaining valid and effective (Carson et al. 2006, Reuer and Devarakonda 2015). Even when unexpected developments may invite opportunism, strong interparty attachment encourages partners to refrain from behaving opportunistically to ensure relationship continuity.

Additionally, the extensive interaction inherent in relational governance mechanisms reduces the probability that the parties will find themselves in such a situation. Interaction improves communication and coordination between the parties, making it more likely

Figure 1. (Color online) Hypotheses



that tasks will be appropriately partitioned and critical information will be communicated accurately (Buckley and Casson 1976, Fichman and Levinthal 1991). Hence, we propose the following hypothesis.

Hypothesis 5. *Under high levels of buyer asset specificity and high technological uncertainty, high levels of relational governance mechanisms are associated with low opportunism, regardless of the levels of formal governance mechanisms and contractual complexity.*

Here again, it is useful to emphasize what we are and are not predicting. We are not predicting that using low levels of relational governance mechanisms dooms a firm to experience high opportunism in this setting. As before, this hypothesis speaks only to (a) the effect of the presence of high levels of relational governance mechanisms and (b) the presence of low opportunism as an outcome.

The same aspects of relational governance mechanisms may also help mitigate opportunism stemming from performance ambiguity, although performance ambiguity's primary threat is moral hazard rather than hold up. Extensive contact between employees may build a sense of common destiny and social identification that discourages opportunistic behavior, even if it were unlikely to be detected (Uzzi 1997).

The richer communication resulting from frequent interpersonal contact may also make it harder for one side to conceal subpar performance that could otherwise be hidden (Parkhe 1993, Carson et al. 2006). The same greater transparency also reduces the likelihood of enduring misperceptions of unequal contribution or benefit, removing a potential trigger of opportunistic behavior (Das and Rahman 2010).

Lastly, when partners expect a long-lasting relationship, in which gross misconduct will not persist undetected, they may be less focused on precisely measuring each other's performance, because they believe that short-term inequalities will even out over the course of the alliance (Poppo and Zenger 2002). Thus, we propose the following hypothesis.

Hypothesis 6. *Under high performance ambiguity, high levels of relational governance mechanisms are associated with low supplier opportunism, regardless of the level of formal governance mechanisms and contractual complexity.*

Figure 1 provides a graphical summary of our hypotheses.

Methods

Research Setting and Sample

Our sampling and data collection approach is similar to that of prior studies of sourcing in the automotive industry, particularly Monteverde and Teece (1982), Gulati et al. (2005), and Gulati and Sytch (2007). A total of 137 buyer-supplier relationships in the German automotive industry serve as the empirical context for this study. This industry is characterized by the high importance of specific investments as well as continuous pressure for technological advances, which makes it a suitable context for our research question. Over the last few decades, manufacturers have considerably reduced their level of vertical integration, shifting manufacturing and also development and design processes to the suppliers, which makes the relationship

between buyers and suppliers much more intense than, for example, in the consumer goods industry.

We used a survey approach to best obtain the microanalytic data required (Mayer 2009). To maximize our response rate, we worked closely with a top-selling German car manufacturer and a large German producer of automotive components that each allowed us to analyze their respective supplier relationships in great detail. Based on our preliminary interviews and research, we did not expect the two stages in the supply chain (end producer and tier 1 component producer) to exhibit any significant differences with regard to our research question. A comparison of the responses showed no significant differences between the two organizations, so that we could safely aggregate the answers into one sample.

First, the development of the questionnaire began with semistructured interviews with procurement managers from 43 companies to get an overview of the research question and its context. Second, we discussed these insights with four industry experts as well as an academic expert panel to rule out potential misunderstandings. Third, we consulted top-ranking journals to identify established scales for measuring the respective variables to be included, translated them into German, and adapted them to our research context if necessary. Fourth, we developed a draft of the questionnaire in close cooperation with two contact persons from the target companies. Fifth, a pretest of the questionnaire with five expert practitioners provided us with feedback regarding some formulations as well as structure and length of the survey.

The finalized questionnaire was then distributed as a web-based survey to our key informants: 222 procurement managers (120 and 102 from company A and company B, respectively). Each procurement manager was responsible for a different component, meaning that each response relates to a different relationship.⁴ Following prior research (e.g., Heide et al. 2007, Hoetker and Mellewigt 2009), we instructed each manager to report on the most important buyer-supplier relationship. Doing so ensured that the manager's responses related to a single buyer-supplier relationship that was sufficiently significant to bring the most likely transaction hazards and governance mechanisms into consideration. From our first set of interviews before sending out the questionnaire, we found that this approach worked better than asking for the concrete name of the supplier and that buyers viewed importance in economic terms (e.g., turnover with that component with a certain supplier), technological terms (technological sophistication), or the criticality of the component for their own production. After internal reminders and follow-up phone calls, we received 137 (88 and 49, respectively) usable answers, a response rate of 62% (73%

and 48%, respectively), much higher than possible with a broad random sampling strategy.

We know little about the characteristics of individual managers, particularly their experience in their current position, although it is reasonable to assume a high level of general educational and/or experiential qualification given their position of managerial responsibility in industry-leading companies. Although they are not directly parallel, we can usefully draw on relevant insights from the regression literature, specifically that the omission of manager experience would be problematic to the degree that it was systematically correlated to both independent and dependent variables. Although the concept of (in-)dependent variable does not exist in QCA, the analogous circumstance would be manager experience affecting both (a) the degree of opportunism experienced and (b) the characteristics of the transaction (which are not within the manager's control) or the governance mechanisms chosen, which we do not expect to be systematically related to managerial experience.

We followed Podsakoff et al. (2003) and Podsakoff et al. (2012) and took several steps to minimize common method bias, which is especially important, because fuzzy set qualitative comparative analysis (fsQCA) offers no equivalent to structural equation modeling's techniques to correct estimates for possible common method bias. First, we separated the placement of the dependent variable (opportunism, part 5 of the questionnaire) and independent variables (governance mechanisms, transaction hazards, parts 2–4 of the questionnaire). As pointed out by Podsakoff et al. (2003), a separation should reduce the respondent's ability to use previous answers to fill in gaps in what is recalled, infer missing details, or answer subsequent questions. Second, we tried to minimize common scale properties by using different scale types and anchor labels. Third, we aimed at improving scale items to eliminate ambiguity. The problem with ambiguous items is that respondents are uncertain how to respond (Podsakoff et al. 2012, p. 551). The best solution to this problem is, for example, to keep questions simple, define ambiguous or unfamiliar terms, and avoid complicated syntax (Tourangeau et al. 2000). Therefore, we relied on well-established scales from prior research, and we pretested the questionnaire extensively by working together closely with the head of the purchasing department of the two companies. Fourth, we think that social desirability is not likely to be a source of common method bias in our study, because we are asking about facts in their most important supplier relationship and not about how well the purchasing manager is performing or about the personality of the manager. Fifth, we considered ability and motivational factors that may cause biased responding.

Regarding ability, Podsakoff et al. (2012) point out that “respondents who are low in verbal ability or education are more likely to respond in a non-differentiated manner” (Podsakoff et al. 2012, p. 560). Ability should not be a problem in our study, because the subjects are well-established purchasing managers, of which most possess a university degree. In addition, participants should be motivated, because we are asking about a central aspect of their daily work. Therefore, the desire for self-expression should be high. Furthermore, the framing of the study was that the company wants to learn more about the effective management of buyer-supplier relationships. Therefore, managers should be motivated to help the firm to find best practices. Sixth, our survey plan protected respondent anonymity, reducing evaluation apprehension. Because we contacted more than 100 managers in each organization, the Works Council required full anonymity of the respondents. Also, in the general instructions of the questionnaire, we pointed out that there are no right or wrong answers; this should reduce people’s evaluation apprehension. The design and length of the questionnaire would not have led respondents to assume that opportunism, its causes, or potential remedies was the focus of the survey.

In addition to the above-mentioned procedural remedies to minimize common method bias, we formally assessed the presence of common method bias by using Harman’s single-factor test. Harman’s single-factor test yielded 12 factors with eigenvalues greater than one, which did not account for the majority of the covariance (the highest factor accounted for 15.6%). Given the skepticism that exists toward the idea of a single-factor test (Podsakoff et al. 2003), we followed the latent variable approach suggested by Podsakoff et al. (2003, p. 894) to control for the effects of an unmeasured latent methods factor. Overall, we find that the common method factor, on average, explains about 6% of the variance in the data, which is considerably less than the medium amount of method variance (25%) identified by Williams et al. (1989) in their review of several empirical studies. In addition, trait variance for all constructs exceeds both method variance and error variance. Method variance was less than 5% for all measures except technological uncertainty, for which we found method variance of 30.2% and trait variance of 66.2%. Overall, the results indicate that common method bias does not seem to be a major concern in our study.

Measures

Table 1 in the online appendix details the operationalization of our key constructs. All are based on established multi-item, seven-point Likert-type scales from the empirical literature that we thoroughly reviewed to

ensure prior construct validity (Macher and Richman 2008). The items were translated into German and reviewed by three bilingual researchers. Cronbach’s alpha for each of the reflective measures exceeded the customary threshold of 0.70.

As indicated in the table, four of our measures meet the criteria for formative measures provided by Diamantopoulos and Winklhofer (2001) and Podsakoff et al. (2006) (that is, they (a) jointly determine the construct in question rather than manifesting an underlying construct, (b) are not interchangeable (removing one alters the domain of the construct), (c) will not necessarily covary positively, and (d) do not have similar antecedents). Taking performance ambiguity as an example, the antecedents of whether the supplier provides a quality certificate and the ease of comparing components across suppliers likely differ. The first stems from the availability of a relevant certificate and the supplier’s decision to pursue certification if available; the second stems from the technological characteristics of the component. By similar reasoning, there is no reason to assume that they would necessarily covary positively. Also, they are not interchangeable. Following the same logic, the information available from items 1, 2, and 4 differs from that available from items 2–4. However, the items jointly determine the construct in questions. Relative to a case where quality certificates are supplied and cross-supplier comparison is easy, a buyer will face greater performance ambiguity when certificates are lacking, cross-supplier comparison is difficult, or most of all, both of those condition exist. Importantly, this is not because they reflect some latent quality of performance ambiguity but because each individually provided information that would reduce the ambiguity faced by the supplier. The same basic logic applies to our other formative measures.⁵

The same thought process helped in addressing a point raised by Ragin (2000, p. 321–328) regarding the construction of higher-order constructs. In some cases, the effect of a construct will depend on the “weakest link” among its factors. In such a case, the effect of a higher-order construct may best be captured by the minimum of its constituent factors. Conversely, if a strong factor is able to substitute for a weak factor, the maximum constituent factor best captures the effect of a higher-order construct. As described above, neither is the case for our measures. Rather, items each contribute to their higher-order construct, and the presence of one can at least partially compensate for the absence of another. Accordingly, our constructs are weighted/unweighted averages for the reflective and formative measures, respectively.

The combinatorial nature of QCA means that each condition increases the number of possible configurations to be considered exponentially. Therefore, a

Table 1. Configurations of Transaction Hazards and Governance Mechanisms for Achieving High or Low Opportunism

| | Outcome: high opportunism | | | | | Outcome: low opportunism | | | | |
|----------------------------------|-------------------------------------------------|------|------|------|------|---------------------------------------------|------|------|------|------|
| | Configuration 1: all cases | | | | | Configuration 2: high asset specificity | | | | |
| | Configuration 3: high technological uncertainty | | | | | Configuration 4: high performance ambiguity | | | | |
| | a | b | c | d | e | a | b | c | d | e |
| Main analysis | | | | | | | | | | |
| Transaction hazards | | | | | | | | | | |
| Asset specificity | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Technological uncertainty | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Performance ambiguity | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Governance mechanisms | | | | | | | | | | |
| Contractual complexity | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Relational governance mechanisms | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Formal governance mechanisms | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Measures of fit | | | | | | | | | | |
| Consistency | 0.86 | 0.82 | 0.85 | 0.85 | 0.85 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Raw coverage | 0.21 | 0.18 | 0.24 | 0.24 | 0.24 | 0.21 | 0.18 | 0.24 | 0.24 | 0.24 |
| Unique coverage | 0.21 | 0.18 | 0.24 | 0.24 | 0.24 | 0.05 | 0.02 | 0.01 | 0.12 | 0.06 |
| Overall solution consistency | 0.86 | 0.82 | 0.85 | 0.85 | 0.85 | 0.78 | 0.78 | 0.78 | 0.85 | 0.85 |
| Overall solution coverage | 0.21 | 0.18 | 0.24 | 0.24 | 0.24 | 0.48 | 0.48 | 0.48 | 0.37 | 0.37 |
| No. of cases in (sub-)sample | 137 | 66 | 68 | 68 | 68 | 69 | 69 | 137 | 137 | 137 |
| Post hoc analysis | | | | | | | | | | |
| Dependence related | | | | | | | | | | |
| Joint dependence | + | + | + | + | + | + | + | + | + | + |
| Dependence asymmetry | – | – | – | – | – | – | – | – | – | – |
| Self-enforcing mechanisms | | | | | | | | | | |
| Importance of reputation | (–) | (–) | (–) | (–) | (–) | (–) | (–) | (–) | (–) | (–) |
| Shadow of the past | | | | | | | | | | |
| Shadow of the future | | (–) | | | | | | | | |

Notes. Solid circles indicate the required presence of a condition, and crossed out circles indicate its required absence. Large circles refer to core conditions, and small circles refer to peripheral conditions. Unfilled cells indicate “do not care” conditions. In the post hoc analysis, + or – indicates that the path mean for the respective additional variable is significantly higher or lower, respectively, than the mean of cases not on the path at $p < 0.05$, and (+) or (–) indicate the same for $p < 0.10$.

researcher must choose the number of conditions to include in a model with reference to the number of cases available to avoid problematically exceeding the diversity of configurations observable in the data (Ragin and Rihoux 2004, Schneider and Wagemann 2010). We followed the recommendation of Marx (2006) regarding the conditions-to-cases ratio and used six conditions (plus the outcome) in our analyses in line with prior QCA studies, such as Schneider et al. (2010), who used six conditions for 76 cases, and Fiss (2011), who used eight conditions for the analysis of 205 cases.

Cognizant of this limitation but wanting to provide additional depth and context to the interpretation of our solution paths, we conducted a post hoc analysis that examined five additional variables suggested by theory (cf. Greckhamer et al. 2013): joint dependence of both parties on each other, dependence asymmetry between supplier and buyer, the importance of a good reputation in the industry, the shadow of the past, and the shadow of the future. Their measurement is detailed in Table 2 in the online appendix.

QCA

QCA is one of several configurational methods that originated in political science and sociology (Rihoux 2003, Ragin and Rihoux 2004), and it has recently diffused into management research (e.g., Kogut et al. 2004, Fiss 2011, Kim 2013). Fiss (2007, 2009) provides an accessible introduction to their application in the management setting. We briefly introduce the logic of QCA here and refer the reader to Fiss (2011) and works cited therein for greater detail. When conducting our analysis, we closely adhered to the standards of good practice for QCA as specified by Schneider and Wagemann (2010).

Although conventional methods analyze the independent net effects of competing explanatory variables, QCA focuses on *combined effects* of causal conditions, because it assumes causation to be complex, intertwined, and holistic (Ragin 1987). To understand relationships among different conditions, researchers examine what sets of characteristics are associated with a given outcome. That way, QCA uncovers *set* relations instead of (*cor*-)relations. This approach allows for equifinality, meaning that multiple combinations of conditions can lead to the same outcome; *nonlinearity*, meaning that the effect of a certain condition may vary according to the presence or absence of other conditions; and *asymmetry*, meaning that the presence of a condition being associated with a given outcome does not necessarily imply that the absence of that condition will be associated with the nonoutcome. These features make QCA particularly well suited to our research question, because we are interested in how transaction

hazards and governance mechanisms combine to determine opportunism, anticipating complex interdependencies, and multiple interactions of these conditions.

Because QCA examines the presence or absence of conditions, it implies the dichotomization of variables representing those conditions. In our case, this would correspond to the presence or absence of high asset specificity, high contractual complexity, etc. Fortunately, the recent development of “fuzzy” techniques allows the researcher to avoid stark, potentially arbitrary divisions. Rather, fsQCA, which we apply, enables a more graduated approach, wherein set membership can be anywhere on a continuum ranging from “fully in” the high category (coded 1) to “fully out” of the high category (coded 0) through calibration of the data.

We followed the direct method of calibration of Ragin (2008). We chose the sample mean of each condition as the crossover point, the point of maximum ambiguity at which we considered it equally probable to represent a low or high case of that condition. We set the thresholds for full membership and full nonmembership (100% and 0% probability of representing a high case of that condition, respectively) to one standard deviation above and below the mean. We then determined values for cases in between these anchor values using the logistical function included in the fsQCA2.0 software package (Ragin 2000, 2006; Wagemann and Schneider 2010).⁶

Next, we constructed *truth tables* (Table 3a–h in the online appendix), which listed all logically possible combinations of conditions and the outcome (Ragin 1987, Ragin and Rihoux 2004). After assigning the fuzzy membership values to all of the conditions, we sorted cases into the respective configurations that they represent and summarized the populated rows of the truth table into simplified combinations, which represent equifinal configurations or “paths” to the outcome in question. From these configurations, we could identify which condition or combination of conditions leads to high or low opportunism. The fuzzy nature of set assignment also allowed us to separate conditions into those that were “core,” meaning that they showed the strongest evidence of causal relationship, and those that were “peripheral,” meaning that the evidence was weaker (cf. Fiss 2011).

With a large number of cases such as we have, it is advisable to only analyze configurations that have enough empirical instances to warrant additional consideration (Ragin 2008). We choose the frequency threshold of at least two empirical cases per truth table row, which leaves us with 70% of our cases included. We set the consistency threshold, how well the configurations (either a single path or the overall term) had to approximate the actual subset relation in the empirical data to be considered, to 0.70. In line with recent

Table 2. Selected Managerial Implications

| Implication | Example from managers |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| It is easier to avoid high opportunism than to achieve low opportunism consistently. Managers should be realistic and set expectations for what governance can achieve accordingly. | A combination of governance mechanisms (e.g., complex contracts and relational governance mechanisms) works well in most cases to avoid high opportunism and even in a lot of cases to achieve low opportunism. However, as our interviews show, complete avoidance of opportunism is impossible because of power asymmetries (see example in the text), a new strategy of the supplier that makes the ordered part a misfit to their strategy (in the text), and heavy financial problems of the supplier and opportunistic action bring short-term financial relief. |
| Performance ambiguity is especially problematic. Ex ante efforts to reduce the scope of performance ambiguity may be a worthwhile investment. | “For example, if the technical specification is not finalized in the moment of signing the contract, this leaves ample opportunities for opportunism.” Handley and Benton (2012, p. 55) report that “[t]he IBM-Texas DIR example illustrates the concern that providers may be inclined to withhold resources or “under-invest” in the relationship if they believe the outsourcing firm is unable to detect such action (i.e., shirking)” (Handley and Benton 2012, p. 55). |
| Best results usually come from applying multiple governance mechanisms. | “In our case the contract in combination with different types of meetings and committees works very well.” Lear corporation deliberately misrepresented its true skills and resources to Ford. “In committing to design and manufacture seats for two sedans, a station wagon, and a high-performance model, the young company had plunged in way over its head. Even a cursory investigation by Ford would have revealed that Lear had a shortage of engineering talent. Lear could have refused the job of course. But a company would have to be nuts to turn down a mega-million-dollar Ford contract” (Walton 1997, p. 152). |
| Used in isolation, relational governance mechanisms range from ineffective to actively harmful. However, they are valuable adjuncts to complex contracts. | “The contract helps to lay down the rules of the game and also states that there are a couple of no goes. Otherwise the supplier does what he wants” (Interview 1, 2017). |
| Formal governance mechanisms may be valuable for coordination and information transfer but are only useful for avoiding opportunism when combined with other governance mechanisms. Even then, the impact may be marginal. | Heide et al. (2007) show that some formal governance mechanisms, like extensive incoming inspection of supplier’s components (output monitoring), reduce opportunism, whereas other formal governance mechanisms, like onsite inspections and quality control procedures (behavior monitoring), even increase opportunism. In addition, they point out that informal agreements serve as a buffer against potential reactance effects from monitoring. |

developments, we preferred the more accurate proportional reduction in inconsistency (PRI) score over the raw consistency score (Mendel and Ragin 2011). Our PRI cutoff of 0.70 corresponds to raw consistency thresholds of well above 0.80, the recommended value of Ragin (2006). Configurations (i.e., combinations of conditions) that fell below this cutoff were eliminated.

Following Schneider and Wagemann (2010), we analyzed necessary and sufficient conditions separately. No condition turned out to be necessary on its own for reaching the outcome or the nonoutcome (i.e., high and low opportunism). Hence, we proceeded to the analysis of the sufficient conditions for both outcome and nonoutcome.

Results

With the above explanation as background, it will be useful to address briefly the issue of potential reverse causality before presenting our results. Consistent with the buyer-supplier literature, we asked respondents to characterize their most important buyer-supplier relationship in its current state. Thus, we observe constellations of transaction hazards, governance mechanisms, and opportunism as they existed at the time of the survey. Because most of the relationships in our

study were well established (the mean duration was 15.5 years, and the median was ten years), the transaction hazards and governance mechanisms that we observed reflect of combination of initial conditions and subsequent adjustments, the combination of which leads to the current level of opportunism. It is reasonable to assume that at least some of that adjustment was intentional.

Just as with regression, our findings must be understood in light of that possibility. Unlike regression, however, fsQCA has not yet developed quantitative responses corresponding to, for example, instrumental variables. In fsQCA’s traditional application to “small-*N*” samples, investigators relied on close knowledge of the cases to validate the mechanisms, iterating between theory, data, and context. To the degree possible in our “large-*N*” setting, we have built on this tradition. Our theoretical predictions reflect prior work on the effects of each hazard and mechanism in isolation, much of which—being regression based—took advantage of econometric means to strengthen evidence of causation. After we obtained our results, we arranged extensive interviews with procurement managers in one of the firms from which the data originated, during which we explored their understanding of the causal

relationships behind the set relationships that we observed. We include evidence from these interviews in our presentation of the results. Ultimately, our quantitative results reveal that a given combination of hazards and mechanisms, however it came about, is consistently associated with low (or high) opportunism. The judicious reader should interpret the totality of evidence with this in mind.

It is also helpful to note that QCA results are not probabilistic. That is, they cannot be interpreted as being only p percent likely to occur were some null hypotheses true. Rather, consistency is calculated from the cases in the data and filtered according to predetermined thresholds. Various means of attaching probabilistic interpretations to values of consistency have been proposed (e.g., Schneider and Grofman 2006, Eliason and Stryker 2009, Fiss et al. 2013). The issue remains unsettled, leading many authors to follow Ragin's advice (Mendel and Ragin 2011) and avoid probabilistic interpretations (e.g., Schneider et al. 2010, Bell et al. 2014), a practice that we follow.

Table 1 shows our results following the graphical method introduced by Ragin and Fiss (2008).⁷ Each column represents one path (or configuration) of the solution formula that leads to either high or low opportunism. Solid circles show the required presence of a condition on that path, and crossed out circles show its required absence. Large circles are core conditions, and small circles refer to peripheral conditions. Unfilled cells indicate conditions that can be either absent or present, and hence, they do not matter for achieving the outcome (Ragin and Fiss 2008). For example, configuration 1 in Table 1 indicates that one configuration for high opportunism involves the presence of high technological uncertainty and high performance ambiguity (as a peripheral condition indicating less strong evidence) along with the absence of all three governance mechanisms. Within this configuration, high asset specificity may be present or absent.

We also report standard measures of fit: consistency, raw coverage, and unique coverage of each path as well as overall consistency and coverage for the solution formula. On average, our calculations exhibit a very high solution consistency of 0.84, which indicates that the solution formulas very well approximate the actual subset relations in the empirical data (Ragin 2006), and a solution coverage of 0.28, which means that our solution terms explain just over 28% of the cases that exhibit the respective outcome.

Solution coverage is partially analogous to R^2 in multiple regression but only partially so. That is, coverage indicates the prominence of a given combination of causal variables (configuration) among the set of combinations leading to the same outcome.⁸ At the extreme, coverage of 1.0 would indicate that the combination was present in every path leading to the

focal outcome—without that combination, the focal outcome would not occur. However, given the fundamental assumption of equifinality of QCA, multiple paths may lead to the same outcome, which could lead to each individual path having relatively low coverage. Indeed, a configuration with low coverage might be particularly interesting if it indicated a path to a desirable outcome that few firms had implemented. Although coverage is generally used descriptively rather than diagnostically (Mendel and Ragin 2011), the relative similarity of coverage scores for all of the configurations in table 4 of Mendel and Ragin (2011) indicates that there was no dominant path to high or low opportunism.

Each of the individual configurations in Table 1 exhibits consistency between 72% and 87%, providing evidence for a strong relationship between observed and hypothesized relationships. Again, the relatively small differences that we observe in consistency across configuration have no diagnostic significance (Ragin 2006).

In line with the assumption of causal asymmetry of fsQCA (Rihoux 2003, Schneider and Wagemann 2010), we separately report the results for the presence and the absence of the outcome (i.e., for high and low opportunism). The first half of Table 1 presents configurations in which firms consistently suffered from high opportunism, whereas the second half shows those in which firms consistently achieved low opportunism (i.e., the absence of high opportunism). Configurations 1 and 5 present configurations for all of the cases. Configurations 2–4 and 6–8 represent analyses based on the subset of cases characterized by high asset specificity, high technological uncertainty, and high performance ambiguity. In the spirit of the assumption of equifinality of QCAs, configurations 4, 5, and 7 had multiple configurations (i.e., they yielded several paths to the outcome, which are labeled alphabetically).

The subsets in configurations 2–4 and 6–8 allow us to examine a point that is widely recognized but little explored in the buyer-supplier literature. Some of the hazards present in a transaction may be deterministic (e.g., a manager may need to source a component that is invariably highly asset specific because of physical, technological, or organizational factors). However, she may have some control over other hazards. For example, she could choose a component imbued with less technological uncertainty (e.g., preferring a well-established technological solution over one on the bleeding edge). Shaping concomitant hazards in this way offers an alternative and complement to the traditional means of mitigating opportunism: the choice of governance mechanisms. As we show below, it is much easier to see these sorts of managerially actionable implications of a configurational analysis than it would be from a regression model.⁹

The richness of results from a QCA analysis admits several ways of interpretation. For simplicity, we begin by examining the governance mechanisms in the order considered in our hypotheses, which are summarized in Figure 1. We then proceed with an interpretation along the different (combinations of) transaction hazards.

Before moving to detailed reporting of our findings, it is worth noting a broader result. Of the configurations considering all cases, we found eight cases leading to high opportunism (configuration 1) and 22 cases leading to low opportunism. This imbalance is in line with a finding that develops out of our detailed analysis: it seems to be easier to avoid arrangements that lead inevitably to high opportunism than to consistently achieve low opportunism. Although consistent with this overall finding, the scarcity of high-opportunism cases means that our evidence for what does lead consistently to high opportunism is relatively limited. Even when one considers the 14 total high-opportunism cases present when one also includes the subset analysis (that is, configurations 1–4 combined), an appropriately cautious interpretation would be to consider our findings regarding the causes of high opportunism as exploratory.

None of the configurations observed contain contractual complexity as the exclusive governance mechanism used in response to high asset specificity and high technological uncertainty, which is the subject of Hypothesis 1. Because this configuration does not appear in any of the configurations for configurations 1–4, we conclude that deploying only contractual complexity in response to high asset specificity and technological uncertainty does not condemn a firm to experiencing high opportunism. Thus, our results fail to support Hypothesis 1.

However, contractual complexity does appear as the sole governance mechanism in one configuration containing high performance ambiguity that leads to high opportunism, supporting Hypothesis 2. Configuration 4a, which involves three cases, indicates that using complex contracts in the absence of formal governance mechanisms, regardless of the (non-)use of high levels of relational governance mechanisms, leads to high opportunism. We discuss configurations 4b–4e below.

A natural question in light of this finding is whether a complex contract is enough to consistently achieve low opportunism given these hazards—which would directly contradict the logic of our hypotheses. Complex contracts as the exclusive response to high asset specificity and high technological uncertainty do not appear among the configurations with low opportunism as an outcome (configurations 5–8). Therefore, there is no evidence in contradiction of Hypothesis 1.

Further examining configurations 5–8, which lead to low opportunism, provides several other insights. Contractual complexity consistently leads to low opportunism in the presence of high technological uncertainty but only if both high asset specificity and high performance ambiguity are absent (configuration a of configuration 7, which includes two cases). This is consistent with the proposition that technological uncertainty is less likely to lead to opportunism when a firm can accurately measure the performance of suppliers and easily change partners if needed.

In summary, although complex contracts are of limited utility in isolation, they still play an important role. Examining configurations 1–4 reveals that the absence of high contractual complexity (eight distinct cases) is a core condition of the majority of configurations leading to high opportunism, suggesting that it plays an important role in constraining opportunism from many different transaction hazards. A Vice President of Purchasing for Automotive Electronic Components provided some insight into the broad relevance of contracting.

In the end, I have never experienced that we have used the contract and go to court. But the contract helps to lay down the rules of the game and also states that there are a couple of no goes. Otherwise the supplier does what he wants.

In addition to helping avoid high opportunism, complex contracts are an element of every configuration leading to low opportunism in the presence of substantial transaction hazards.¹⁰ Therefore, they are an important part—but only part—in achieving low opportunism.

Hypothesis 3 and Hypothesis 4 considered formal governance mechanisms. In response to the combination of high asset specificity and technological uncertainty, we found no configuration leading to high opportunism that contained high levels of only formal governance mechanisms, failing to support Hypothesis 3. The same pattern holds given high performance ambiguity, failing to support Hypothesis 4. Having failed to support these hypotheses, we then looked to see if using high levels of only formal governance mechanisms was sufficient to consistently achieve low opportunism, which would contradict the hypothesis. Configuration 5a (16 cases) is the only one in which formal governance mechanism alone leads to low opportunism, but this requires the absence of any substantial hazards. Thus, the evidence neither supports nor directly contradicts Hypothesis 3 and Hypothesis 4. Formal governance mechanisms are insufficient in isolation to achieve low opportunism given high levels of any hazard, but their exclusive use is not consistently associated with high opportunism either.

However, we find strong evidence that the absence of formal governance mechanisms makes it much more likely that the firm will experience high opportunism. Seven of eight configurations leading to high opportunism (14 distinct cases in total) include the lack of formal governance mechanism.

Despite their limitations when used in isolation, formal governance mechanisms feature in three of four remaining configurations leading to low opportunism. All of these observations are consistent with the idea that formal governance mechanisms are useful for coordination and information transfer but suffer from a lack of legal enforceability when used in isolation. Both contracts and relational governance mechanisms seem to depend strongly on the presence of the behavioral and output monitoring provided by formal governance mechanisms.

Hypothesis 5 and Hypothesis 6 examined relational governance mechanisms as a response to the combination of high asset specificity and high technological uncertainty as well as high performance ambiguity, respectively. None of the relevant configurations leading to low opportunism contain high levels of only relational governance mechanisms, failing to support the hypotheses. Looking at high opportunism as an outcome, we find no configurations involving the exclusive use of high levels of relational governance mechanisms in response to high asset specificity and technological uncertainty. However, as a response to performance ambiguity, configuration 4b, which includes three cases, reveals that high opportunism occurs when relational governance mechanisms are used in response to high performance ambiguity without the support of formal governance mechanisms, in line with the logic of the above paragraph. Configuration 4e, which includes four cases, shows that, given the additional hazard of high technological uncertainty, high levels of relational governance mechanisms without the support of a complex contract are associated with high opportunism. This configuration contradicts the logic of Hypothesis 6, although the contradiction is only partial, because this configuration also includes high technological uncertainty as a peripheral condition.

More broadly, our results suggest that relational governance mechanisms may be more limited than their proponents have suggested. Unlike the other two governance mechanisms under study, there are no situations in which relational governance mechanisms are sufficient on their own to achieve low opportunism. Furthermore, of the five configurations leading to low opportunism, they do not feature at all (its presence or absence is irrelevant) in two. Of particular note, they are irrelevant in configuration 7a for high technological uncertainty, the situation for which it is often put forward as particularly efficacious.

Despite the lack of consistent association with low opportunism, examining the configurations in configurations 1–4 suggests that relational governance mechanisms have a nuanced relationship to high opportunism. On the one hand, their absence is part of one-half of the configurations leading to high opportunism. That is, their presence removes the inevitability of high opportunism.

On the other hand, they are limited as a response to high performance ambiguity, appearing in three of five configurations (eight distinct cases in total) leading to high opportunism. They are ineffective in constraining opportunism unless supported by the monitoring of formal governance mechanisms (configurations 4b and 4c) or complex contracts (configuration 4e).

For additional insights, we also calculated the mean values of the additional variables described in Table 2 in the online appendix for cases in each configuration and compared them with the average values for cases not in the configurations (post hoc analysis in Table 1). Although based on *t* tests and not a formal test of membership in a given configuration, this information still proves some suggestive insights.

Doing so shows that cases in the latter configuration, configuration 4e, are characterized by a higher than average shadow of the past, suggesting that buyers may have relied on relational governance alone on the basis of extended prior experience with the supplier. These findings are consistent with evidence that relational governance mechanisms in the absence of a rigorous contracting may lead to an overly “cozy” atmosphere, in which the supplier anticipates second chances, a blind eye to minor violations, and a high willingness to renegotiate contract terms (Hoetker and Mellewigt 2009).

Additional Analysis and Discussion

Moving beyond our formal hypotheses, our results provide additional insights regarding combinations of transaction hazards and governance mechanisms. We start with the observation that most of the configurations leading to high opportunism involve the absence of all three governance mechanisms (configurations 1–3 and 4d). This suggests a certain degree of interchangeability among the governance mechanisms. Across a range of hazard conditions, it seems that using any of the mechanisms creates the possibility of avoiding high opportunism.

An implication of the apparent ease of avoiding the inevitability of high opportunism is that configuration 1 results from the simplification of only two configurations reported in Table 3a in the online appendix (the third configuration leading to high opportunism contained only one case and thus, fell short of the threshold for inclusion). These two configurations contain eight cases in total. Although the sparsity of paths leading to

inevitable high opportunism is what we would expect if that fate was relatively easy to avoid, the flip side is that our evidence for what does lead consistently to high opportunism is based on relatively few lines of each truth table and in turn, relatively few cases. Indeed, the same eight cases are also those in configuration 2 (two cases), configuration 3 (six cases), and configuration 4d (eight cases). For the reasons explained,⁹ the configurations that result when high asset specificity, technological uncertainty, or performance ambiguity is unavoidable differ from the general case reported in configuration 1. For the same reasons, multiple configurations were possible a priori for any of the subsets, although they only appeared for high performance ambiguity (configurations 4a–4c and 4e, which contain in total six distinct cases, none of which were included in configuration 1). In all, 14 distinct cases are contained in the configurations leading to high opportunism. Our results for high opportunism should thus be treated as more exploratory than our results for low opportunism, which we discuss next.

Configurations 5–8 show that consistently achieving low opportunism as opposed to merely avoiding a consistent outcome of high opportunism is more challenging. With the exception of configurations 5a and 7a, which each contain no or only one elevated transaction hazard presence of high performance ambiguity, achieving low opportunism requires the use of at least two governance mechanisms. Complex contracts and relational governance mechanisms jointly appear in three of the configurations that do so, with both being core components in two of the configurations, suggesting that they have a synergistic effect and complement each other. In addition to contracts' disciplining role discussed above, relational governance mechanism can provide relief when unforeseen changes or conflicts arise and rigid contracts reach their limits (Poppo and Zenger 2002, Lee and Cavusgil 2006). For example, a Vice President of Purchasing reported that, "[i]n our case the contract in combination with different types of meetings and committees works very well" (interview with the Vice President of Purchasing for Automotive Electronic Components). In total, 28 distinct cases were involved in the configurations leading to low opportunism. Of these, 22 appeared in "All cases" configurations: 15 in configuration 5a and seven in configuration 5b. Configuration 6 (high asset specificity) contains three cases, all of which were contained in either configuration 5a or 5b. The configurations based on high technological uncertainty cases contain six distinct cases. Configuration 7a contains two cases, and configuration 7b contain four cases.

Although it is theoretically useful to understand the impact of each governance mechanism, managers will usually approach the question from the viewpoint of the hazards that they face. Therefore, we close our

analysis by considering the results from the perspective of transaction hazards.

Configurations 5b and 6 show that asset specificity without the presence of other transaction hazards poses a significant but solvable governance challenge. On the one hand, there are two configurations that lead consistently to low opportunism, suggesting that the problem of high asset specificity is addressable. On the other hand, both of these configurations require the use of all three governance mechanisms, although formal governance mechanisms are only a peripheral condition in both configurations. Both configurations are also associated with a higher than average importance of reputation, suggesting that a business context in which a good reputation matters may also help constrain opportunism. These configurations are especially interesting in light of Walker and Weber (1984), who noted, "if either little or no uncertainty is associated with a transaction, the buyer can specify all (or almost all) the contingencies that might impinge on contract execution and thus defend against supplier opportunism. Thus, according to Williamson's model, *uncertainty and supplier asset specificity are joint conditions for a decision to make a component*" (Walker and Weber 1984, p. 37, emphasis added).

When high technological uncertainty is the only transaction hazard, low opportunism can be consistently obtained through contractual complexity alone: configuration 7a. Interestingly, the cases in this configuration have a lower than average level of joint dependence, which—in combination with the absence of high asset specificity—suggests that the ability to switch suppliers may easily restrict opportunistic behavior to the degree that a complex contract alone is sufficient. No configuration with it as the only hazard is consistently associated with high opportunism (configurations 1–4). In isolation, it seems that this transaction hazard is fairly easy to manage.

Among the subset of cases with high performance ambiguity, no configuration leads consistently to low opportunism (configuration 8). This indicates that performance ambiguity is particularly difficult to govern, even in isolation. One purchasing manager reported the following (interview with Vice President of Purchasing for Diesel Systems).

Ideally, we work with two suppliers for a certain part. But some parts are so highly sophisticated that we have no choice and we work with a single supplier. The closer we get to series production, the more vulnerable we are to the supplier. Recently, we ordered diesel injection technology from a supplier. Certain parts that we put into the injector have to meet certain requirements regarding cleanliness. If these parts don't meet these cleanliness requirements, then the injector doesn't work. In the contract, the supplier agreed to deliver these parts that meet our cleanliness requirements. The supplier

also delivered a sample in advance that met our requirements. When the parts are delivered you cannot see immediately if they meet your requirements, you only get to know it later in the production process. As we got closer to series production we got to know that the supplier doesn't have the capabilities to produce this part with the required degree of cleanliness. To be clear, the part itself is not technologically complex, but the process to meet our requirements regarding cleanliness is complex. In the contract as well as in the specification book he agreed to this standard, even though he didn't have the capabilities to do this. He just wanted to have the order (Interview 2, 2017).

High performance ambiguity is also associated with high opportunism as an outcome. Even when it is the only substantial hazard present, the failure to engage in monitoring through high levels of formal governance mechanisms leads to high opportunism. Minus this monitoring, high levels of relational or contractual governance mechanisms—or even both in combination—are insufficient to avoid high opportunism.

More interesting insights come from examining combinations of transaction hazards. The combination of high performance ambiguity and high technological uncertainty is associated with two configurations leading to high opportunism: configurations 4d and 4e. One purchasing manager noted that technological uncertainty when signing the contract is very often accompanied by performance ambiguity because of difficulties *ex ante* in specifying performance parameters as well as assessing the effort of the supplier: "In general, if I source a complex part where the technical specification is not finalized in the moment I sign the contract, this is a gateway for extra charges by the supplier" (interview with the Vice President of Purchasing for Diesel Systems; Interview 2, 2017). We found no configuration leading to low opportunism in the presence of both high asset specificity and performance ambiguity. Among cases with high technological uncertainty, consistently achieving low opportunism in the presence of high performance ambiguity required the use of all three governance mechanisms as core conditions: configuration 7b. Additionally, cases in this configuration have a higher than average importance of reputation, which may provide an additional brake on opportunism.

The general pattern among the post hoc variables is that paths to low opportunism exhibited high levels of self-enforcing mechanisms (reputation, shadow of the past, shadow of the future). Paths to high opportunism, however, exhibited high levels of joint dependence that asymmetrically favor the supplier but did not generally differ from the other cases in terms of most self-enforcing mechanisms. Two examples from our interviews show that asymmetric dependence on the supplier might lead to high opportunism. The first example is from an

interview with the Vice President of Purchasing for Automotive Electronic Components (Interview 1, 2017).

We are buying microcontroller from one of the big semiconductor producers. We have discussions with this supplier for years because he doesn't deliver the quality we need. I mean it is a technological complex product, but we have a contract that clearly specifies the quality targets that the supplier has to deliver. We get then monthly reports stating that this supplier is the worst supplier in our whole group. We are escalating this to the board and then our CEO is talking to their CEO and we are trying to get more commitment. But it is obvious that they don't change much. We basically have discussions about quality on all levels, like on the operative level, steering committees and so on. The problem is that this big semiconductor producer is "system-relevant" and cannot be substituted. To make it clear, we are asking for a quality level well beyond the market average and in order to achieve this kind of service level the supplier would have to make specific investments which he ultimately refuses to do. This supplier is very profitable by just providing a standard quality for the market. Nevertheless, we have a clear contract which states clear quality goals.

The second example is from an interview with the Senior Vice President of Purchasing for Automotive Business Castings Actuation (Interview 3, 2017).

A long-term supplier of die-casting parts increased the prices in an existing contract by 20%. We replied that this is not acceptable since there were no reasons for an increase in costs on their side. In the negotiations they basically made it clear that these parts don't fit any longer to their strategy and their portfolio of products. Since they know that we have in the contract a right for delivery of these products for 15 years after termination of the contract, they wanted to motivate us to look for a new supplier.

The shadow of the future, interestingly, seems relatively unimportant in both analyses, rarely differing significantly from the general mean.

Contributions and Opportunities for Future Research

We began by positing that a richer understanding of the complex interactions between transaction hazards and governance mechanisms than had previously been possible could significantly advance our understanding of opportunism. Our findings confirm this proposition.

To summarize, we found that many configurations leading consistently to high opportunism were those featuring low levels of every governance mechanism. In other words, applying a high level of any single governance mechanisms often makes it possible for a firm to avoid high opportunism. This is an encouraging finding, because it suggests that even hazard-rich relationships can avoid high opportunism given relatively minimal governance activity. Unfortunately, the story is more discouraging when it comes to the

consistently achieving low opportunism. In all but the most hazard-free relationships, achieving low opportunism requires high levels of multiple governance mechanisms, often in specific combinations.

Our first contribution is to show the robustness of the central tenants of the literature on governing interfirm relationships. Despite substantial empirical and theoretical progress, sufficient inconstancies persist for some scholars to question the theoretical underpinnings of entire literature—a challenge partially attributable to limitations inherent in the regression studies that make up the vast bulk of the literature (David and Han 2004, Macher and Richman 2008, Mayer 2009). We have applied a distinct conceptual and statistical methodology, which offers different strengths and weaknesses, and confirmed prior studies' findings that governance mechanisms only succeed if they match the demands of the transaction hazards present. Doing so provides important evidence in support of the current understanding of buyer-supplier relationships. Moreover, applying a configurational approach, like QCA, allowed us to go much farther by allowing for non-linearity, equifinality, and asymmetry in a way that regression-based models cannot.

Our second contribution is the set of insights that result from examining the outcomes of combinations of transaction hazards and governance mechanisms in their entirety rather than examining their constituent parts or limited combinations thereof. Among the most intriguing is that it is easier to create the possibility of avoiding high opportunism than to consistently achieve low opportunism. Although there were multiple equifinal pathways to either outcome, the sets of paths were very different.

For the purpose of avoiding high opportunism, the governance mechanisms that we studied were often interchangeable. In contrast, consistently achieving low opportunism required a combination of governance mechanisms in most situations, particularly those with several transaction hazards present at the same time. Within these combinations, governance mechanisms were not generally interchangeable. Relational governance mechanisms in isolation seem more restricted than their proponents have suggested but form a powerful synergistic combination with complex contracts.

We found that asset specificity is both more and less consequential than might be assumed. When it appears in isolation as a transaction hazard, there is a path—albeit a demanding one—to low opportunism. However, its presence makes both technological uncertainty and performance ambiguity much more difficult to deal with. Performance ambiguity, in isolation or in combination, seems exceptionally challenging to govern.

These insights enable our third contribution, providing researchers and practitioners alike an approach to countering opportunism that reflects the full

complexity of transaction hazards and governance mechanisms. Table 2 summarizes the most important and actionable managerial implications of our study. In particular, the framework invites consideration of a new decision calculus. Rather than assuming that managers seek to optimize the balance of potential opportunism and governance costs along some continuum, future research could consider situations in which managers prioritize achieving low opportunism versus merely seeking to avoid the “really bad deals” that make high opportunism nearly inevitable.

Our final major contribution is to show the power of a configurational approach to developing and testing hypotheses regarding the complex relationships between firms. We hope that this demonstration will encourage the development of new theory that moves beyond the linear, deterministic, and symmetric predictions most easily tested with regression-based techniques. As a concrete example of the potential of fsQCA, we note three insights that would be impossible or much more convoluted to obtain via regression.

First, we showed that, when there is equifinality of responses to a given set of hazards, governance mechanisms are not necessarily functionally equivalent. That is, there may be multiple ways to get to a given outcome given the same hazards, but that does not mean that, say, formal governance mechanisms will yield the same outcome as relational mechanisms (Kim 2013 also discusses equifinality versus functional equivalence).

Second, we showed that there was not functional equivalence of governance mechanisms (individually or in combination) across hazards. The fact that the combination of complex contracts and high levels of relational governance leads to low opportunism in the face of high asset specificity does not mean that it will do so given high performance ambiguity. Some regression-based papers have studied the issue of matching governance mechanisms to hazards (e.g., Hoetker and Mellewigt 2009), but these have been methodologically limited to studying the fit between individual hazards and mechanisms rather than the multifaceted configurations of hazards and mechanisms as fsQCA permits.

Third, we showed that configurations consistently leading to high opportunism are not the mirror image of configurations leading to low opportunism. In regression, if low levels of a mechanism are associated with high opportunism, then high levels of that mechanism should be associated with low opportunism. In contrast, we found that using a high level of at least one governance mechanisms was generally sufficient to avoid consistently experiences high opportunism. However, consistently reaching low opportunism generally required high levels of multiple mechanisms in specific combinations.

Several limitations provide opportunities for additional research. A longitudinal approach could reveal more about the temporal ordering and dynamics of transaction hazards, governance mechanisms, and opportunism. Techniques to include temporality in QCA are, however, less fully developed than their regression counterparts (Caren and Panofsky 2005). Two-sided data collection might provide additional insights, although it would inevitably involve a lower response rate and less detailed data than our focused approach was able to produce. Because configurations leading consistently to high opportunism seem to be relatively rare, a larger data set would be helpful in generating more relevant cases, thus increasing confidence in the relationships revealed.

Surveying only two organizations enabled a level of detail and response rate that would have been impossible in a less focused survey, responding to calls for scholars to pursue both large- and small-scale studies because of their complementary role in understanding governance (Macher and Richman 2008, Mayer 2009). Doing so obviously increases concerns about generalizability, which we sought to address in several ways. As described above, we compared the mean values for all of our conditions across firms with those of 31 other studies, finding no significant difference between the sample-weighted mean and pooled standard deviations for our firms and the other studies. Relatedly, we compared the mean values for all conditions between the two firms in the study, again finding no difference.

Although this gives us confidence that these firms are not unusual in their characteristics, it is possible that one or both might deal with governance hazards unusually well or poorly. The results of Jap and Anderson (2003) suggest that combining a large buyer and its suppliers as we did is unlikely to mask significant differences, but we were unable to compare the firms with each other directly, because our data set was too small to allow us to run our analysis for each firm separately. However, the similarities between values for our firm's conditions and those other studies included both causes (hazards and governance choice) and outcomes, which suggest that, at a minimum, the relationships that we observed are not radically atypical. Also, because we surveyed a large number of managers within each firm, any firm-level effect would have to be very pervasive. Lastly, as noted above, the broad patterns of our findings are consistent with prior studies. Of course, we hope to see future complementary fsQCA studies based on larger surveys, even if they will perforce be more general.

Three additional issues offer opportunities in terms of generalizability. First, common to all single-industry studies, it is necessary to consider any unique elements of our focal industry. Including firms at two different levels of the industry value chain provides some

variation, but both firms operate in segments characterized by very advanced management of supplier relationships. Less sophisticated industries or those with less intense buyer-supplier ties could yield different results. In particular, although our interviews established technological uncertainty as the most important form of uncertainty in our setting, other types of uncertainty (e.g., demand uncertainty) might be more relevant in other industries. Second, as recent research suggests, the effectiveness of contractual and relational governance is dependent on national culture (Handley and Angst 2015) as well as the strength of legal institutions (Zhou and Xu 2012). Because our sample stems from the German Automotive Industry, our results are bound to countries with strong legal institutions and may not apply to other national cultures or countries with weak legal institutions. Third, interpretation of our results is contingent on the conditions that we included. Omitting a condition or adding an additional one would likely yield different configurations, perhaps revealing new relationships among the currently included conditions. Although we chose our conditions based on established theory and prior empirical results, future researchers could usefully include alternative conditions, with our post hoc analysis suggesting several possibilities (additional examples: Hawkins et al. 2013, Luo et al. 2015, Walter et al. 2015, Huo et al. 2016, Villena and Craighead 2017).

Just as this paper has shown important complementarities among governance mechanisms, we hope to have shown the value of configurational approaches, such as fsQCA, as complements to the regression paradigm in the study of interfirm relationships. Indeed, given the importance of complexity, interrelatedness, and contingency in the study of strategy, we foresee an expanding range of applications.

Acknowledgments

The authors thank editor Peer Fiss and three anonymous referees for their contributions to the paper.

Endnotes

¹ We discuss the distinction between contracts and formal governance mechanisms, which are sometimes linguistically conflated, below.

² “Fuzzy set” QCA, which we apply, avoids strict dichotomization by characterizing observations as ranging between “fully in” and “fully out” of the high or low categorization.

³ The term “formal” has unfortunately sometimes been used in the literature to mean essentially “written” as opposed to verbal, informal aspects of a relationship. This usage unintentionally conflates contracts, which are a specific type of legal instrument associated with third-party enforcement mechanisms (courts), with formal governance mechanisms, the “underlying and concrete management and control activities, which describe in detail how the required behavior of the partner will become motivated, influenced, and established, or more generally, in which ways the desirable or predetermined gains are to be fulfilled” (Hoetker and Mellewigt 2009, p. 1027). Despite occasional terminological confusion, prior

studies have appropriately examined these as two separate phenomena. On the distinction and potential interaction between contracts of formal governance mechanisms (“operational mechanisms” in their terminology), see Das and Rahman (2002).

⁴ These are two very large and diversified companies, where the purchasing is organized around different components. Because we have 137 different buyer-supplier relationships from two highly diversified firms and are asking the procurement manager about their most important supplier relationship, there might be the small chance that some of these 137 relationships belong to the same buyer-supplier relationship on the corporate level. We do not expect this to affect our results, because (a) the companies are very decentralized and (b) the hazards and management differ on the component level.

⁵ A reviewer questioned the formative nature of several of our measures. Because there is no expectation for formative measures to exhibit any particular level of consistency (high or otherwise), this issue is not amenable to quantitative resolution.

⁶ Calibration of variables in fsQCA is not mechanistic. It is usually preferable to calibrate according to the best external criteria available (Ragin 2008), applying substantive knowledge to the greatest degree possible. For example, Misangyi and Acharya (2014) calibrated *outside director independence* relative to the voting thresholds of firms. Bell et al. (2014) were able to follow a long-established scale and calibrated *prestigious underwriter* based on the position of underwriters on “tombstone” announcements. Fiss (2011) used European Union enterprise size classes as the basis for classifying firm size. Unfortunately, substantively based external criteria are not always available. In these cases, scholars have fallen back on either the distribution of values in their sample (e.g., the measure of *administrative complexity* in Fiss 2011, *strong home country investor protection* in Bell et al. 2014, and *market for corporate control* in Misangyi and Acharya 2014) or reference to values from other studies (e.g., calibrating *price premium* against the price premium reported in prior studies (Bell et al. 2014)) or external data (e.g., organizational performance calibrated against quartiles of relevant industry sectors as reported by the United Kingdom Government (Fiss 2011)). Scholars have often used these in conjunction. For example, Fiss (2011) confirmed that his measure of administrative complexity was roughly consistent with the mean score of prior studies that had used a prior measure. Following this lead, we reviewed 31 empirical papers about opportunism in strategic alliances corresponding to a total sample size of 5,724 companies. The sample-weighted mean and pooled standard deviations from these studies (rescaled to a seven-point scale as needed) closely matched those of our study, and recalibrating our sample using those values yielded almost identical membership values.

⁷ Following the advice of Ragin (2008, p. 160–175), we present the intermediate solution, which Legewie (2013, section 3.5) describes as including “selected simplifying assumptions to reduce complexity, but should not include assumptions that might be inconsistent with theoretical and/or empirical knowledge.” Specifically, we assume that the presence of high levels of hazards is associated with high opportunism and that their absence is associated with low opportunism. High levels of governance mechanisms, in contrast, are associated with low opportunism, and their absence is associated with high opportunism.

⁸ Unique coverage simply shows how much of the overall coverage stems exclusively from the respective path (Schneider and Grofman 2006).

⁹ It is important to note that the “subset” configurations are not equivalent to reanalyzing a subset of the relationships reported in the “all cases” truth tables (Tables 3a and 3b in the online appendix). Rather, each analysis began with construction of its own truth table based only on cases with high asset specificity (Tables 3c and 3d in the online appendix), high technological uncertainty (Tables 3e and 3f in the online appendix), and high performance ambiguity (Tables 3g and 3h in the online appendix). It naturally follows that the configurations in the truth table omit the variable by which they were

subsampled (e.g., Tables 3c and 3d in the online appendix do not include asset specificity as an input condition). As Schwellnus (2013, p. 3) pointed out, “irrelevant” cases can contribute to the calculation of consistency and coverage in fsQCA, because their values are not zero. Thus, although any given configuration contains the same cases across all tables, its consistency—and thus, the coding of its output—may differ. Also, low values of the variable in question (e.g., low asset specificity) are not considered as potential counterfactuals during the Boolean simplification. As a result, solutions may appropriately emerge from subset analysis that were not present in the “all cases” analyses.

¹⁰ Configuration a of Model 5, in which the level of contractual complexity does not matter for the outcome, involves low levels of all hazards, suggesting a low overall likelihood of opportunism.

References

- Alchian AA, Demsetz H (1972) Production, information costs, and economic organization. *Amer. Econom. Rev.* 62(5):777–795.
- Argyres N (1995) Technology strategy, governance structure and interdivisional coordination. *J. Econom. Behav. Organ.* 28(3):337–358.
- Argyres N, Bercovitz J, Mayer K (2007) Complementarity and evolution of contractual provisions: An empirical study of IT services contracts. *Organ. Sci.* 18(1):3–19.
- Armour HO, Teece DJ (1980) Vertical integration and technological innovation. *Rev. Econom. Statist.* 62(3):470–474.
- Balakrishnan S, Wernerfelt B (1986) Technical change, competition and vertical integration. *Strategic Management J.* 7(4):347–359.
- Barzel Y (1982) Measurement cost and the organization of markets. *J. Law Econom.* 25(1):27–48.
- Bell RG, Filatotchev I, Aguilera RV (2014) Corporate governance and investors’ perceptions of foreign IPO value: An institutional perspective. *Acad. Management J.* 57(1):301–320.
- Bensaou M, Anderson E (1999) Buyer supplier relations in industrial markets: When do buyers risk making idiosyncratic investments? *Organ. Sci.* 10(4):460–481.
- Buckley P, Casson M (1976) *The Future of Multinational Enterprise* (Macmillan and Co., London).
- Caren N, Panofsky A (2005) TQCA: A technique for adding temporality to qualitative comparative analysis. *Sociol. Methods Res.* 34(2):147–172.
- Carson SJ, Madhok A, Wu T (2006) Uncertainty, opportunism, and governance: The effects of volatility and ambiguity on formal and relational contracting. *Acad. Management J.* 49(5):1058–1077.
- Crosno JL, Dahlstrom R (2008) A meta-analytic review of opportunism in exchange relationships. *J. Acad. Marketing Sci.* 36(2): 191–201.
- Dahlstrom R, Nygaard A (1999) An empirical investigation of ex post transaction costs in franchised distribution channels. *J. Marketing Res.* 36(2):160–170.
- Das TK, Rahman N (2002) Opportunism dynamics in strategic alliances. Contractor FJ, Lorange P, eds. *Cooperative Strategies and Alliance* (Emerald, Bingley, UK), 89–118.
- Das TK, Rahman N (2010) Determinants of partner opportunism in strategic alliances: A conceptual framework. *J. Bus. Psych.* 25(1): 55–74.
- Das TK, Teng BS (2002) Alliance constellations: A social exchange perspective. *Acad. Management Rev.* 27(3):445–456.
- David RJ, Han S (2004) A systematic assessment of the empirical support for transaction cost economics. *Strategic Management J.* 25(1): 39–58.
- Deeds DL, Hill CWL (1998) An examination of opportunistic action within research alliances: Evidence from the biotechnology industry. *J. Bus. Venturing* 14:141–163.
- Demsetz H (1988) The theory of the firm revisited. *J. Law, Econom., Organ.* 4(1):141–161.

- Diamantopoulos A, Winklhofer HM (2001) Index construction with formative indicators: An alternative to scale development. *J. Marketing Res.* 38(2):269–277.
- Dyer J, Singh H (1998) The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Acad. Management Rev.* 23(4):660–679.
- Eliason SR, Stryker R (2009) Goodness-of-fit tests and descriptive measures in fuzzy-set analysis. *Sociol. Methods Res.* 38(1):102–146.
- Fichman M, Levinthal D (1991) History dependence and professional relationships: Ties that bind. *Res. Sociol. Organ.* 8:119–153.
- Fiss PC (2007) A set-theoretic approach to organizational configurations. *Acad. Management Rev.* 32(4):1180–1198.
- Fiss PC (2009) Case studies and the configurational analysis of organizational phenomena. Byrne D, Ragin CC, eds. *The SAGE Handbook of Case-Based Methods* (Sage, London), 424–440.
- Fiss PC (2011) Building better causal theories: A fuzzy set approach to typologies in organization research. *Acad. Management J.* 54(2):393–420.
- Fiss PC, Sharapov D, Cronqvist L (2013) Opposites attract? Opportunities and challenges for integrating large-n QCA and econometric analysis. *Political Res. Quart.* 66(1):191–198.
- Geyskens I, Steenkamp JBEM, Kumar N (2006) Make, buy, or ally: A transaction cost theory meta-analysis. *Acad. Management J.* 49(3):519–543.
- Greckhamer T, Misangyi VF, Fiss PC (2013) The two QCAs: From a small-N to a large-N set-theoretic approach. *Res. Sociol. Organ.* 38:49–75.
- Greckhamer T, Misangyi VF, Elms H, Lacey R (2008) Using qualitative comparative analysis in strategic management research: An examination of combinations of industry, corporate and business-unit effects. *Organ. Res. Methods* 11(4):695–726.
- Gulati R, Lawrence PR, Puranam P (2005) Adaptation in vertical relationships: Beyond incentive conflict. *Strategic Management J.* 26(5):415–440.
- Gulati R, Sytch M (2007) Dependence asymmetry and joint dependence in interorganizational relationships: Effects of embeddedness on a manufacturer's performance in procurement relationships. *Admin. Sci. Quart.* 52(1):32–69.
- Handley SM, Angst CM (2015) The impact of culture on the relationship between governance and opportunism in outsourcing relationships. *Strategic Management J.* 36(1):1412–1434.
- Handley SM, Benton WC (2012) The influence of exchange hazards and power on opportunism in outsourcing relationships. *J. Oper. Management.* 30(1/2):55–68.
- Hawkins TG, Pohlen TL, Prybutok VR (2013) Buyer opportunism in business – to – business exchange. *Indust. Marketing Management* 42(8):1266–1278.
- Heide JB (1994) Interorganizational governance in marketing channels. *J. Marketing* 58(1):71–85.
- Heide JB, John G (1990) Alliances in industrial purchasing: The determinants of joint action in buyer-supplier relationships. *J. Marketing Res.* 27(1):24–36.
- Heide JB, Wathne KH, Rokkan AI (2007) Interfirm monitoring, social contracts, and relationship outcomes. *J. Marketing Res.* 44(8):425–433.
- Hoetker G, Mellewigt T (2009) Choice and performance of governance mechanisms: Matching alliance governance to asset type. *Strategic Management J.* 30(10):1025–1044.
- Huo B, Wang Z, Tian Y (2016) The impact of justice on collaborative and opportunistic behaviors in supply chain relationships. *Internat. J. Production Econom.* 177:12–23.
- Jap SD, Anderson E (2003) Safeguarding interorganizational performance and continuity under ex post opportunism. *Management Sci.* 49(12):1684–1701.
- Joshi AW, Stump RL (1999a) The contingent effect of specific asset investments on joint action in manufacturer-supplier relationships: An empirical test of the moderating role of reciprocal asset investments, uncertainty, and trust. *J. Acad. Marketing Sci.* 27(3):291–305.
- Joshi AW, Stump RL (1999b) Determinants of commitment and opportunism: Integrating and extending insights from transaction cost analysis and relational exchange theory. *Canadian J. Admin. Sci.* 16(4):334–352.
- Kim M (2013) Many roads lead to Rome: Implications of geographic scope as a source of isolating mechanisms. *J. Internat. Bus. Stud.* 44(9):898–921.
- Kogut B, MacDuffie JP, Ragin C (2004) Prototypes and strategy: Assigning causal credit using fuzzy sets. *Eur. Management Rev.* 1(2):114–131.
- Lee Y, Cavusgil ST (2006) Enhancing alliance performance: The effects of contractual-based vs. relational-based governance. *J. Bus. Res.* 59(8):896–905.
- Legewie N (2013) An introduction to applied data analysis with qualitative comparative analysis. *Forum Qualitative Sozialforschung* 14(3):15.
- Luo Y (2006) Opportunism in cooperative alliances: Conditions and solutions. Shenkar O, Reuer JJ, eds. *Handbook of Strategic Alliances* (Sage, Thousand Oaks, CA), 55–80.
- Luo Y (2007) Are joint venture partners more opportunistic in a more volatile environment? *Strategic Management J.* 28(1):39–60.
- Luo Y, Liu Y, Yang Q, Maksimov V, Hou J (2015) Improving performance and reducing cost in buyer – supplier relationships: The role of justice in curtailing opportunism. *J. Bus. Res.* 68(3):607–615.
- Macher JT, Richman BD (2008) Transaction cost economics: An assessment of empirical research in the social sciences. *Bus. Politics* 10(1):1–63.
- Martinez JJ, Jarillo JC (1989) The evolution of research on coordination mechanisms in multinational corporations. *J. Internat. Bus. Stud.* 20(3):489–514.
- Marx A (2006) Toward more robust model specification in QCA: Results from a methodological experiment. COMPASS Working paper Series 2006-43 (AP University College Antwerp, Antwerp, Belgium).
- Masten SE (1984) The organization of production: Evidence from the aerospace industry. *J. Law Econom.* 27(2):403–417.
- Masten SE, Saussier S (2002) Econometrics of contracts: An assessment of developments in the empirical literature on contracting. Brousseau E, Glachant JM, eds. *The Economics of Contracts: Theories and Applications* (Cambridge University Press, Cambridge, UK), 273–292.
- Mayer KJ (2009) Construct validity and other empirical issues in transaction cost economics research. Bergh DD, Ketchen DJ, eds. *Research Methodology in Strategy and Management*, vol. 5 (Emerald, Bingley, UK), 213–236.
- Mendel JM, Ragin CC (2011) FsQCA: Dialog between Jerry M. Mendel and Charles C. Ragin. *USC-SIPI Report 411*, University of Southern California, Los Angeles.
- Misangyi VF, Acharya AG (2014) Substitutes or complements? A configurational examination of corporate governance mechanisms. *Acad. Management J.* 57(6):1681–1705.
- Monteverde K, Teece DJ (1982) Supplier Switching Costs and Vertical Integration in the Automobile Industry. *Bell J. Econom.* 13(1):206–213.
- Noordewier TG, John G, Nevin JR (1990) Performance outcomes of purchasing arrangements in industrial buyer-vendor relationships. *J. Marketing* 54(4):80–93.
- Ouchi WG (1980) Markets, bureaucracies, and clans. *Admin. Sci. Quart.* 25(1):129–141.
- Parkhe A (1993) Strategic alliance structuring: A game theoretic and transaction costs examination of interfirm cooperation. *Acad. Management J.* 36(4):794–829.
- Podsakoff PM, Mackenzie SB, Lee JY, Podsakoff NP (2003) Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J. Appl. Psych.* 88(5):879–903.

- Podsakoff PM, MacKenzie SB, Podsakoff NP (2012) Sources of method bias in social science research and recommendations on how to control it. *Annual Rev. Psych.* 63:539–569.
- Podsakoff NP, Shen W, Podsakoff P (2006) The role of formative measurement models in strategic management research: Review, critique, and implications for future research. *Res. Methodology Strategy Management* 3:197–252.
- Poppo L, Zenger T (1998) Testing alternative theories of the firm: Transaction cost, knowledge-based, and measurement explanations for make-or-buy decisions in information services. *Strategic Management J.* 19(9):853–877.
- Poppo L, Zenger T (2002) Do formal contracts and relational governance function as substitutes or complements? *Strategic Management J.* 23(8):707–725.
- Poppo L, Zhou KZ (2013) Managing contracts for fairness in buyer-supplier exchanges. *Strategic Management J.* 35(10):1508–1527.
- Ragin CC (1987) *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies* (University of California Press, Berkeley, CA).
- Ragin CC (2000) *Fuzzy-Set Social Sciences* (University of Chicago Press, Chicago).
- Ragin CC (2006) Set relations in social research: Evaluating their consistency and coverage. *Political Anal.* 14(3):291–310.
- Ragin CC (2008) *Redesigning Social Inquiry: Fuzzy Sets and Beyond* (University of Chicago Press, Chicago).
- Ragin CC, Fiss PC (2008) Net effects analysis vs. configurational analysis: An empirical demonstration. Ragin CC, ed. *Redesigning Social Inquiry: Fuzzy Sets and Beyond* (University of Chicago Press, Chicago), 190–212.
- Ragin CC, Rihoux B (2004) Qualitative comparative analysis (QCA): State of the art and prospects. Qualitative Methods. *Newsletter of the Amer. Political Sci. Assoc. Organized Section on Qualitative Methods* 2:3–12.
- Reuer JJ, Ariño A (2002) Contractual renegotiations in strategic alliances. *J. Management* 28(1):47–68.
- Reuer J, Devarakonda S (2015) Mechanisms of hybrid governance: administrative committees in non-equity alliances. *Acad. Management J.* 59(2):510–533.
- Rihoux B (2003) Bridging the gap between the qualitative and quantitative worlds? A retrospective and prospective view on qualitative comparative analysis. *Field Methods* 15(4):351–365.
- Schepker DJ, Oh WY, Martynov A, Poppo L (2014) The many futures of contracts: Moving beyond structure and safeguarding to coordination and adaptation. *J. Management* 40(1):193–225.
- Schneider C, Grofman B (2006) It might look like a regression equation... but it's not! An intuitive approach to the representation of QCA and FS/QCA results. Working paper, Central European University, Budapest, Hungary.
- Schneider CQ, Wagemann C (2010) Standards of good practice in qualitative comparative analysis (QCA) and fuzzy sets. *Comparative Sociol.* 9(3):397–418.
- Schneider MR, Schulze-Bentrop C, Paunescu M (2010) Mapping the institutional capital of high-tech firms: A fuzzy-set analysis of capitalist variety and export performance. *J. Internat. Bus. Stud.* 41:246–266.
- Schwellnus G (2013) Eliminating the influence of irrelevant cases on the consistency and coverage of necessary and sufficient conditions in fuzzy-set QCA. Working paper (University of Vienna, Vienna, Austria).
- Senior Vice President Corporate Sector Purchasing and Logistics, Automotive Business Castings Actuation and Controls (2017) Interview by Thomas Mellewigt. Tape recording, April 12. Stuttgart, Germany.
- Stump RL, Heide JB (1996) Controlling supplier opportunism in industrial relationships. *J. Marketing Res.* 33(4):431–441.
- Tourangeau R, Rips LJ, Rasinski K (2000) *The Psychology of Survey Response* (Cambridge University Press, Cambridge).
- Uzzi B (1997) Social structure and competition in interfirm networks: The paradox of embeddedness. *Admin. Sci. Quart.* 42(1):35–67.
- Vice President Corporate Sector Purchasing and Logistics, Automotive Business Electronic Components (2017) Interview by Thomas Mellewigt. Tape recording, April 12. Stuttgart, Germany.
- Vice President Corporate Sector Purchasing and Logistics, Project Management Diesel Systems (2017) Interview by Thomas Mellewigt. Tape recording, April 12. Stuttgart, Germany.
- Villena VH, Craighead CW (2017) On the same page? How asymmetric buyer – supplier relationships affect opportunism and performance. *Production Oper. Management* 26(3):491–508.
- Wagemann C, Schneider CQ (2010) Qualitative comparative analysis (QCA) and fuzzy-sets: Agenda for a research approach and a data analysis technique. *Comparative Sociol.* 9(3):376–396.
- Walker G, Weber D (1984) A transaction cost approach to make-or-buy decisions. *Admin. Sc. Quart.* 29(3):373–391.
- Walter SG, Walter A, Müller D (2015) Formalization, communication quality and opportunistic behavior in R&D alliances between competitors. *J. Product Innovation Management* 32(6):954–970.
- Walton M (1997) When your partner fails you. *Fortune* (May 26) 135(10):151–154.
- Watne KH, Heide JB (2000) Opportunism in interfirm relationships: Forms, outcomes, and solutions. *J. Marketing* 64(4):36–51.
- Williams LJ, Cote JA, Buckley MR (1989) Lack of method variance in self-reported affect and perceptions at work: reality or artifact? *J. Appl. Psych.* 74(3):462–468.
- Williamson OE (1975) *Markets and Hierarchies* (Free Press, New York).
- Williamson OE (1985) *The Economic Institutions of Capitalism* (Free Press, New York).
- Zhou KZ, Xu D (2012) How foreign firms curtail local supplier opportunism in China: Detailed contracts, centralized control, and relational governance. *J. Internat. Bus. Stud.* 43(7):677–692.

Thomas Mellewigt holds the chair of Strategic Management at the Freie Universität Berlin, Germany. His research focuses on governance of strategic alliances and buyer-supplier relationships. His work has been published in international journals such as *Strategic Management Journal*, *Journal of Applied Psychology*, and *Journal of Business Venturing*. He is a four-time winner of the “Best Teaching Award” of the School of Business and Economics at his university.

Glenn Hoetker is professor of business strategy at Melbourne Business School, University of Melbourne. His interests are at the confluence of strategy, innovation, and globalization. He is currently exploring these issues in the context of sustainability, particularly clean energy. He is an associate editor for *Strategic Management Journal* and the Strategic Management Society’s new *Strategic Management Review* and serves on the editorial boards of *Organization Science* and *Strategy Science*.

Martina Lütkewitt is project manager with undconsorten, a German boutique top-management consultancy specializing in improving organizational performance through levers like strategy, leadership, and performance management. She earned her PhD from the Department of Management at Freie Universität Berlin. Her research interests include trust and opportunism in strategic alliances and buyer-supplier relationships as well as advancements in qualitative comparative analysis methodology.