Moderating effect of supply chain complexity in governance mechanisms and operational performance relationship: evidence from a sub-Saharan African market

Emmanuel Kwabena Anin

Department of Procurement and Supply Chain Management, Kumasi Technical University, Ghana. Box 854, Kumasi-Ashanti, Ghana.

E-mail: emmanuel.kanin@kstu.edu.gh

Nathaniel Boso

Department of Marketing and Corporate Strategy, Kwame Nkrumah University of Science and Technology, University Post office, Kumasi – Ghana.

Gordon Institute of Business Science, University of Pretoria, South Africa

E-mail: nboso@knust.edu.gh ; boson@gibs.co.za

David Asamoah

Department of Supply Chain and Information Systems, Kwame Nkrumah University of Science and Technology, University Post office, Kumasi – Ghana.

E-mail: dasamoah.ksb@knust.edu.gh

ABSTRACT

This study draws on the tenets of transaction cost economics to examine the moderating effect of supply chain complexity on the relationship between formal control and social control mechanisms, and operational performance. The study argues that under conditions of increased supply chain complexity, the effect of formal control mechanism on operational performance is weakened while the effect of social control mechanism on operational performance is strengthened. These propositions are tested on a sample of 331 firms in a sub-Saharan Africa market, Ghana. Findings from the study show that at higher levels of supply chain complexity, formal control and social control have negative and positive effects on operational performance, respectively. These findings provide nuanced perspectives on how the performance consequences of formal and social controls vary under the same organizational circumstance. Theoretical and managerial implications are discussed.

Keywords: Governance Mechanisms; Formal Control; Social Control; Operational Performance; Supply Chain Complexity; Ghana

1. Introduction

Supply chain networks and interfirm relationships in weak institutional environments have undergone rapid transformation in recent years (El Baz, Laguir, & Stekelorum, 2019). In particular, firms operating in such environments are deepening their interfirm relationships to leverage scarce resources and emerging opportunities to boost operational performance (El Baz et al., 2019). Weak institutional environments are characterized by low enforcement of the rules of law (or broad de facto discretion with respect to their application), and low institutional durability, in that formal rules change repeatedly, rarely surviving fluctuations in power and preference distributions (Brinks, Leiras, & Mainwaring, 2014). Under this institutional environment conditions, interfirm relationship activities are often fraught with heightened exchange hazards, which can undermine operational performance (Amankwah-Amoah, Debrah, & Nuertey, 2018). Given the prevalence of weak institutional conditions in many other parts of the Global South (such as sub-Saharan Africa), scholars have suggested that additional research is needed to better understand how firms in weak institutional environments address interfirm relationship hazards to improve operational performance (El Baz et al., 2019; Amankwah-Amoah et al., 2018).

Prior research suggests two interfirm governance mechanisms (GMs) that firms may use to address interfirm relationship hazards: formal control and social control (Huang, Cheng, & Tseng, 2014; Rhee, Kim, & Lee, 2014; Zhang & Keh, 2010). Formal control refers to the extent to which an exchange relationship is governed by a formally written legal contract (Huang et al., 2014; Abdi & Aulakh, 2012) while social control depicts the extent to which exchange relationships are governed by shared values, cooperative norms and trust (Cao & Lumineau, 2015; Huang et al., 2014). Despite the potency of these GMs to help firms manage interfirm relationship hazards, evidence shows that the use of GMs in interfirm exchanges may not always contribute to stronger operational performance. While some scholars have reported positive effects of GMs on a variety of performance outcomes (e.g., Cao & Lumineau, 2015; Huang et al., 2014; Poppo & Zenger, 2002), others have found evidence to suggest that variation in levels of GMs is not always

associated with changes in operational performance (e.g., Wacker, Yang, & Sheu, 2016; Hoetker & Mellewigt, 2009). A major argument often provided to support these varying findings is that even the most carefully crafted contracts (i.e. formal control) are insufficient in addressing interfirm exchange hazards in that the capacity of formal control mechanism to regulate commercial conduct of exchange parties is limited by both practicality and the law itself (Huang et al., 2014; Cannon, Achrol, & Gundlach, 2000; Williamson, 1985). Other studies have also argued that the flexibility and adaptive properties embedded in social control mechanism may be more effective in managing exchange hazards (Poppo, Zhou, & Li., 2016; Noordewier, John, & Nevin, 1990). These competing arguments about the value of GMs raise a fundamental question about when the use of formal control and/or social control mechanisms is beneficial for improving the performance of organizations.

To address this interfirm exchange problem, this study proposes the notion of supply chain complexity as a major contingency force that may moderate the effect of GMs on operational performance. Supply chain complexity (SCC) refers to the number of actors and product lines associated with a focal firm's supply chain network (Bozarth, Warsing, Flynn, & Flynn, 2009). This study argues that SCC may moderate the GMs-operational performance relationship due to its capacity to induce uncertainty and associated decision-making and coordination costs (Lu & Shang 2017; Bode & Wagner, 2015; Manuj & Sahin, 2011; Bozarth et al., 2009) to the extent that increases in the decision-making and interfirm relationship coordination costs associated with SCC may serve as a lever to weaken the relationship between formal control mechanism and operational performance. On the contrary, given its high degree of flexibility and adaptive properties, social control is likely to be a more effective tool in managing interfirm exchange hazards when uncertainties introduced by SCC are greater (Poppo et al., 2016; Adler, 2001). Thus, the relationship between social control mechanism and operational performance is likely to be strengthened when SCC increases in magnitude. Despite this recognition, theoretical specification and empirical examination of this moderating effect relationship remains limited. The purpose of

this study, therefore, is to extend the interfirm governance literature by theoretically specifying and empirically examining how SCC moderates the relationship between formal and social control mechanisms, and operational performance.

This research makes two major contributions to interfirm governance literature. First, by modeling SCC as a contingency of the effects of formal control and social control on operational performance, the study offers new theoretical and managerial insights to enrich an understanding on how the performance benefits of GMs can be enhanced. In doing so, the study responds to a recent call on interfirm governance researchers to further examine relevant boundary conditions of the relationship between GMs and performance outcomes (Cao & Lumineau, 2015). As a direct response to this call, this study advances knowledge of interfirm governance by examining the extent to which SCC weakens the effect of formal control mechanism while at the same time strengthening the effect of social control mechanism on operational performance. Second, in drawing on data from a sub-Saharan African market, the study addresses the issue of under-representation of the sub-Saharan African setting in supply chain research (El Baz et al., 2019) by examining the proposed relationship within a context often noted for its weak institutional environment conditions. By so doing, the study broadens contextual understanding of the interfirm relationships phenomenon beyond industrialized markets in the Global North (Poppo et al., 2016; Huang et al., 2014; Wang, Yeung, & Zhang, 2011). While interfirm relationships phenomenon continues to increase in Africa (El Baz et al., 2019), and the use of GMs becomes critical (Huang et al., 2014; Hoetker & Mellewigt, 2009), this research provides value to supply chain managers in Africa to the extent that it offers useful guidelines on when GMs can be more or less beneficial to firms.

The article is organized as follows: after the introduction, the theoretical background and hypotheses formulation are presented. The study then describes empirical approaches followed to obtain data and operationalize key constructs in the study. Next, the paper presents the measurement and structural model estimation, followed by a discussion of key findings from the

study. Finally, the study's limitations and avenues for further research and conclusion are presented.

2. Theoretical Background and Hypotheses

Research into interfirm GMs has drawn on a variety of theoretical perspectives. Key among these are transaction cost economics (TCE) (Huang et al., 2014; Hoetker & Mellewigt, 2009; Poppo & Zenger, 2002; Cannon et al., 2000; Williamson, 1985), relational exchange theory (Joshi & Stump, 1999; Haugland, 1999), social exchange theory (Penttinen & Palmer, 2007), social network theory (Claycomb & Frankwick, 2010) and resource-based view (Burkert, Ivens, & Shan, 2012). This study draws on the TCE to investigate how SCC conditions the effect of formal and social control on operational performance.

While TCE is generally used to explain the governance of interfirm relationships and why firms choose certain business transactions over others (Jacobs & Swink, 2011), Williamson (1991) indicates that TCE is also useful for explaining organizational structures and actions within a firm. Typically, a product portfolio and multiplicity of channel members manifest structural properties (i.e., complexity) (Jacobs & Swink, 2011). As such, TCE logic can be used to explain how the complexity of product portfolio and the multiplicity of channel members may affect firm transactions (Jacobs & Swink, 2011).

The core assumptions of TCE (Williamson, 1975; Coase, 1937) include the notion of bounded rationality and opportunism (Wathne & Heide, 2000; Williamson, 1985). Opportunism refers to "self-interest seeking with guile" (Williamson, 1975, p.6) and includes "lying, stealing, cheating and calculated effort to mislead, distort, disguise, obfuscate or otherwise confuse" (Williamson, 1985, p.47). TCE argues that given the opportunity, an exchange party would behave opportunistically to the extent that such behavior will lead to profitable outcomes (Hawkins, Wittmann, & Beyerlein, 2008; John, 1984). In the context of interfirm exchanges, opportunistic

tendencies of exchange parties manifest in behaviors such as withholding or misrepresenting key information and compromise of quality standards.

The notion of bounded rationality, on the other hand, assumes that individuals who make decisions have limitations on cognition, access to complete relevant information, and a sufficient amount of time (Simon, 1982). The complexity associated with interfirm relationships induces uncertainty (Chowdhury, Quaddus, & Agarwal, 2019; Bozarth et al., 2009) that can restrict decision-makers' ability to obtain and use relevant information for decision-making. Further, managing a multiplicity and diversity of interfirm exchanges coupled with product variety could be more costly due to the number of transactions required to support them (Conner, 1991). For example, as organizations' product lines and interfirm exchange networks (supplier and customer interface) increase in scope and diversity, the complexity required to manage also increases. In particular, greater diversity and multiplicity of interfirm exchanges engender greater relationship-based uncertainties that amplify the scope of information processing load, coordination, and administrative processes, resulting in a high cost of transaction (Rothaermel, Hitt, & Jobe, 2006; Hitt, Hoskisson, & Kim, 1997; Sanchez & Mahoney, 1996).

While GMs have been suggested as major tools for regulating the conduct of interfirm exchange parties (Huang et al., 2014; Coltman, Bru, Perm-Ajchariyawong, Devinney, & Beniot, 2009; Williamson, 1985) their effectiveness in addressing exchange hazards is likely to be dependent on the degree of the complexity associated with the exchange relationship. Hence, from the lens of TCE, we argue in Figure 1 that SCC might be an important boundary conditioning factor in the GMs-operational performance linkages. Specifically, we develop and test the notion that at high levels of SCC, increased use of formal control would undermine operational performance while the operational performance benefit of social control would enhance under the same condition.

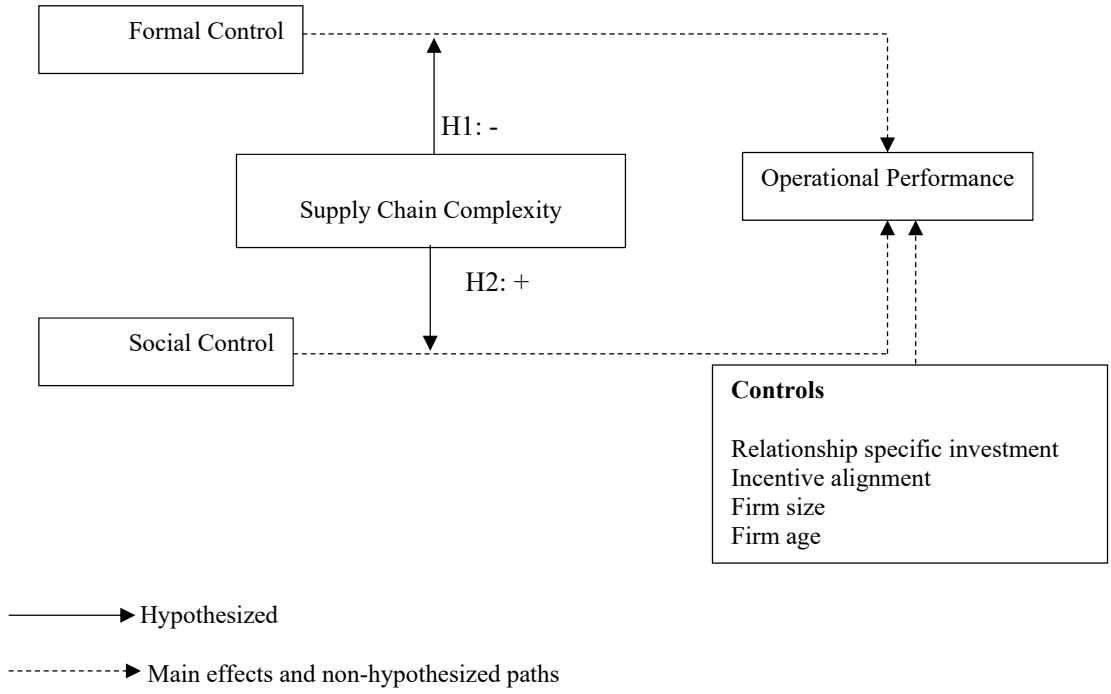

Figure 1: Research Model

2.1. Governance mechanisms and operational performance

Interfirm GM refers to the underlying control activities designed by firms to manage exchange relationships (Huang et al., 2014; Cai, Yang, & Hu, 2009; Hoetker & Mellewigt, 2009). Broadly, the interfirm governance literature commonly discusses GMs to encompass two key dimensions: formal control and social control (Cao & Lumineau 2015; Huang et al., 2014; Reuer & Arino, 2007; Cavusgil, Deligonul, & Zhang, 2004; Poppo & Zenger, 2002). Formal control refers to the extent to which an exchange relationship is governed by a formally written legal contract, which explicitly stipulates the responsibilities and obligations of each party (Huang et al., 2014; Abdi & Aulakh, 2012; Ryall & Sampson, 2009). Social control captures relational-based GM (Cao & Lumineau, 2015; Huang et al., 2014; Jayaraman, Narayanan, Luo, & Swaminathan, 2013) and involves the extent to which exchange relationships are governed by shared values, social and cooperative norms and trust (Cao & Lumineau, 2015; Huang et al., 2014; Li, Xie, Teo, & Peng, 2010; Poppo & Zenger, 2002). Unlike formal control, social control utilizes a set of social norms to

regulate and restrict unacceptable or opportunistic behaviors of parties in exchange relationships (Huang et al., 2014; Cai et al., 2009).

Empirically, studies on the substitutability and complementarity perspectives of these controls and their influence on performance outcomes have received substantial attention in the interfirm governance literature (Cao & Lumineau, 2015; Huang et al., 2014) where a stream of studies report that both forms of GMs may substitute each other because of their functional equivalents and pernicious effects of formal control and social control GMs (Huber, Fischer, Dibbern, & Hirschheim, 2013; Liu, Li, & Zhang, 2010). An alternative stream of studies argues that the two forms of control may complement each other to drive performance as they can address each other's limitations in exchange relationships (see Huang et al., 2014; Cannon et al., 2000). Beyond the substitutability and complementarity debate in the interfirm governance literature, the unique effects of formal and social control on performance outcomes have also been examined in a variety of settings. However, findings have remained largely inconclusive. For example, while some studies find positive significant relationships between formal control and exchange performance outcomes (e.g., Cao & Lumineau, 2015; Huang et al., 2014; Ferguson, Paulin, & Bergeron, 2005; Poppo & Zenger, 2002), others find negative relationships (e.g., Osmonbekov, Gregory, Chelariu, & Johnston, 2016; Li et al., 2010). Similarly, whereas a number of studies report a significant positive association between social control and exchange performance outcomes (Osmonbekov et al., 2016; Huang et al., 2014; Poppo & Zenger, 2002), others find the contrary (Cai et al., 2009; Hoetker & Mellewigt, 2009).

Given such a mixed picture of effects in the extant literature, some scholars have investigated certain environmental contingencies that may explain the conditions under which the two GMs may drive performance outcomes. Rhee et al., (2014) find that the performance consequences of contract and social control is dependent on levels of environmental dynamism. Additionally, Poppo et al., (2016) find that relational trust is more effective when buyer asset specificity is high while calculative trust relates more strongly to supplier performance at high

levels of behavioral uncertainty. Although studies questioning the linearity of the relationship between GMs and performance outcomes have helped advance knowledge on interfirm governance mechanism, the issue of SCC as a major conditioning factor seems ignored despite its importance to supply chain managers and scholars (Lu & Shang, 2017; Bode & Wagner, 2015; Christopher, 2012; Bozarth et al., 2009).

2.2. Moderating Effects of Supply Chain Complexity

The notion of complexity of supply chain networks has been conceptualized in terms of multiplicity, diversity, and interrelatedness of elements in a system (Jacobs & Swink, 2011). Jacobs and Swink (2011) refer to multiplicity as a larger number of elements that make up a system. From this perspective, complexity has been conceptualized in supply chain literature in terms of the number of suppliers, customers, and products that characterize a firm's network of relationships (Lu & Shang, 2017; Bozarth et al., 2009; Choi & Krause, 2006; Rutenberg & Shaftel, 1971). In terms of diversity, complexity has been conceived as the degree of differences among elements in a supply chain system (see Campbell, 1988; Aldrich, 1979), while from an interrelatedness standpoint, complexity has been conceptualized as the degree of interactions among elements within a system (Mazzocchi, 2008; Tatikonda & Stock, 2003).

Although some studies have conceptualized complexity in supply chains from a combination of different perspectives (Whetten & Aldrich, 1979; Child, 1972), others have focused on the multiplicity view (Bozarth et al., 2009; Novak & Eppinger, 2001). Bozarth et al., (2009), for example, conceptualized supply chain complexity from the multiplicity perspective in terms of upstream, internal, and downstream dimensions. Lu and Shang (2017) observe that capturing the interactivity of complexity fully and objectively is difficult and, therefore, conceptualized SCC in terms of multiplicity with emphasis on first-tier suppliers (horizontal and vertical complexities). Building on these foundational precepts, we draw on the multiplicity perspective to define SCC as the number of ties or actors and product lines associated with a firm's supply chain network (Lu &

Shang, 2017; Bozarth et al., 2009). Actors refer to the number of suppliers and customers (ties) with whom a firm has a relationship while product lines refer to the number of product varieties a firm offers to the market. Additionally, besides the easiness of measurement with such conceptualization (Lu & Shang, 2017), opportunism, a major hazard in buyer-seller relationships, potentially amplifies with the number of actors.

Prior research indicates that SCC induces complications and uncertainty within interfirm exchanges (Chowdhury et al., 2019; Bode &Wagner, 2015; Bozarth et al., 2009). Opportunism and bounded rationality are also likely to be more pronounced with SCC due to multiple actors and interactions. From the TCE line of reasoning, SCC is a source of transaction cost in interfirm exchanges since dealing with its associated uncertainty and opportunism (through negotiations, contracting, and monitoring) demands more resources and efforts (Williamson, 1975). TCE argues that formal control, with its contractual structure, represents an effective interfirm governance mechanism that can mitigate opportunism and other hazards associated with interfirm exchanges to facilitate coordination and improve performance (Wang et al., 2011; Wathne & Heide, 2000; Williamson, 1985). As an administrative tool (Martinez & Jarillo, 1989), formal control drives operational performance by specifying roles and responsibilities of parties such as delivery time, quality standards, volume and price requirements, monitoring procedures, and sanctions for non-compliance to regulate the behaviors of parties to exchanges (Huang et al., 2014; Wang et al., 2011).

However, the use and functionality of formal control largely require a relatively predictable environment where it is possible to obtain stable information to accurately assess trade-offs (Poppo et al., 2016). In addition, because complexity-induced complications and uncertainty create instability that is difficult for formal control to respond to (Carson, Madhok, & Wu, 2006), and also frustrate prediction, the controlling efficacy of the latter diminishes under such conditions. Accordingly, we contend that under conditions of high levels of SCC, increased adoption of formal control is likely to render its instrumental benefit for enhancing operational performance less

effective. The underlying logic is that at high levels of SCC, interfirm exchanges tend to be prone to increased complications, uncertainty (Lu & Shang, 2017; Bozarth et al., 2009), opportunism, and bounded rationality (Williamson, 1985). Such hazards require a rather detailed and highly complex contract to mitigate, which will be prohibitively costly to maintain because exchange partners would need to spend significant amount of time and resources on monitoring to ensure that the spirit of the agreement is fulfilled (Huang et al., 2014; Dyer & Chu, 2003).

Further, rigidity is another limitation of formal control (Huang et al., 2014; Thorgren & Wincent, 2011). In interfirm exchanges, adjustment and adaptation are critical for meeting exchange goals since unexpected contingencies, particularly under high levels of SCC, are always a possibility. However, as Cannon et al., (2000) argue, formal control tends to be less flexible and limited in its capacity to respond to the degree of uncertainty and changes required under high SCC. The provision of "good faith" in the Uniform Commercial Code (1978) for contracting behavior underscores the insufficiency of formal contracts as control mechanisms (Cannon et al., 2000). The resultant high cost of transaction (arising from monitoring, renegotiations, and supervision) and the rigidity characterizing complex contracts (Huang et al., 2014) make the use of formal control counterproductive when SCC is high, and thus potentially erode the incremental benefits and gains accrued. In short, the lack of flexibility, and high transaction costs associated with the increased use of formal control in responding to the exchange hazards and uncertainty under high levels of SCC is likely to dilute its (formal control) capacity to enhance operational performance. Thus, in the face of high levels of SCC, we expect that the direct positive effect of formal control on operational performance is likely to be attenuated. This is broadly consistent with prior evidence that firms may lose confidence in contracts as hazards become particularly severe (Poppo & Zenger, 2002; Crocker & Masten, 1991), which are likely to manifest under high levels of SCC.

Conversely, when SCC is low, the exchange environment is relatively stable and predictable because of fewer complications and uncertainty. Such an environment provides a fit condition for

the effective and efficient functioning of formal control in enhancing operational performance because exchange hazards and frequent adaptation to changes are less (Poppo et al., 2016; Carson et al., 2006; Rousseau, Sitkin, Burt, & Camerer, 1998). Consequently, under low SCC conditions, the scope of exchange transaction and associated cost is expected to be minimal, thereby, making the use of formal control more relevant and beneficial in driving operational performance. Therefore, we propose that:

> *Hypothesis 1. Supply chain complexity negatively moderates the relationship between formal control and operational performance, such that at higher levels of supply chain complexity, the positive effect of formal control mechanism on operational performance is weakened.*

The study further argues that the social control-operational performance link is contingent on differences in SCC across interfirm exchanges. From the argument of relational exchange process, social control, through relational norms and trust, can mitigate exchange hazards and inspire commitment to improving exchange performance (Huang et al., 2014; Poppo & Zenger, 2002). Consequently, with its relational and trust-building characteristics, social control facilitates information sharing and allows for a greater degree of flexibility (Lu, Guo, Qian, He, & Xu, 2015; Wang & Wei, 2007). While effective information sharing reduces information asymmetry and encourages a culture of joint problem solving and conflict resolution within the exchange, flexibility on the other hand allows parties to adapt to unforeseen circumstances to leverage cooperative benefits (Poppo & Zenger, 2002). In particular, the adaptability and receptiveness of social control to complex and uncertain environments (Poppo et al., 2016; Ivens & Blois, 2004) make it more appropriate under conditions of high SCC. Again, by its orientation to cooperativeness, good faith, and a sense of oneness (Poppo et al., 2016; Olander, Hurmelinna-Laukkanen, Blomqvist, & Ritala, 2010; Cai et al., 2009), social control is further expected to suppress opportunism, facilitate joint decision-making and problem solving through the timely flow of information to improve visibility and predictability. This helps reduce uncertainty and minimize

the need for rigorous negotiation, monitoring, inspection (of quality processes and standards), and associated cost of transaction. As Adler (2001) posits, social control reduces transaction costs by replacing contracts with ‘handshakes'.

In line with the foregoing, we posit that due to its cost efficiency as well as the inherent flexibility and adaptive capabilities to respond to complexity-induced complications and uncertainty, social control is likely to be more beneficial to firms’ operations when it is utilized under the conditions of high SCC. Accordingly, we contend that at high levels of SCC, increased adoption of social control may strengthen the positive relationship between social control and operational performance. This contention is consistent with prior research (e.g., Poppo et al., 2016; Rousseau et al., 1998; Crocker & Masten, 1991) that shows that the effect of relational trust on performance is positive when market uncertainty is high, and that relational norms are required more under conditions of increased unpredictability.

On the contrary, previous research suggests that social control is less relevant for coordination of exchange parties when uncertainty is low (Poppo et al., 2016; Rousseau et al., 1998). In particular, Poppo et al., (2016) find that the effect of relational trust on performance is insignificant at low levels of market uncertainty. Thus, it can be argued that increased use of social control may become less beneficial for operational performance when SCC is low. This contention is in line with Rousseau et al.,’s (1998) assertion that social control is less efficacious in less complex environments because the need for adaptability, which is an important social control capability for facilitating coordination (Poppo et al., 2016), is less in such environments. By this reasoning, and consistent with prior research (e.g., Poppo et al., 2016), we expect that the direct positive effect of social control on operational performance will be dampened under conditions of low SCC. Accordingly, we hypothesize that:

Hypothesis 2. Supply chain complexity positively moderates the relationship between social control and operational performance, such that at high levels of supply chain complexity, the positive effect of social control on operational performance is strengthened.

3. Methodology

3.1. Design and Sample

In line with prior research (Poppo et al., 2016; Huang et al., 2014), we used survey research design to collect data from organizations operating in multiple industries in a sub-Saharan African market, Ghana. This context is relevant for the study in that opportunism, conflicts, and uncertainty, which are major setbacks to effective collaborative efforts, are inherent aspects of interfirm exchanges in Ghana, making such a context suitable for testing models of interfirm GMs (Amankwah-Amoah et al., 2018; Slade Shantz, Kistruck, Pacheco, & Webb, 2020). With its fast-growing economy in the sub-region (African Development Bank, 2018), coupled with rapid institutional and structural changes (Parente, Rong, Geleilate, & Misati, 2019; World Bank, 2017), firms in Ghana (as with other sub-Saharan Africa markets) face increasing levels of uncertainty and dynamism (Dadzie, Winston, & Hinson, 2015), and a growing need to engage in interfirm exchanges. Moreover, given that resources (e.g., financial capital) are hard to come by due to underdeveloped capital markets and subsistent-based consumption in Ghana (Banin, Boso, Hultman, Souchon, Hughes, & Nemkova, 2016), opportunistic behaviors are likely to be prevalent in interfirm relationships, making GMs key for securing resources and safeguarding exchanges.

In addition, given the weak institutional structures and law enforcement conditions in sub-Saharan Africa (Parente et al., 2019), effectuation of formal control in such an environment may be unique and intriguing, and the use of social control as a governance tool may be prevalent. Additionally, the socio-cultural condition in this society places greater emphasis on interdependency and communality (Slade Shantz et al., 2020), making social control relevant in interfirm relationship management. Furthermore, Ghana remains the easiest place to do business in West Africa Sub-region (African Development Bank Group, 2020) and operates an open market economy that has led to an increased presence of privately owned businesses (Boso, Donbesuur, Bendega, Annan, & Adeola, 2017; Adomako, Danso, & Ofori Damoah, 2016) and foreign direct investments in that country. Importantly, the Ghanaian context shares many characteristics with

other developing economies (Boso et al., 2013; Acquaah, 2007), and therefore, provides a viable context to research interfirm alliance governance from a developing economy perspective.

The study's sample was drawn from a database of privately owned firms provided by the Ghana Statistical Service. The database contained names, addresses, and telephone numbers of senior company executives. The firms in the database were screened to ensure that the following study criteria are met: (1) that the firms are owned and controlled by private individuals with majority ownership; (2) that the firms have been operating in this sub-Sahara African country for at least three years; and (3) that the firms employ a minimum of five full-time staff. Consistent with prior research (Adomako, Opoku, & Frimpong, 2018; Boso, Cadogan, & Story, 2013), we relied on key informants in each firm to obtain data. Typical respondents included Chief Executive Officers (15%), General Managers (21%), and Operations Managers (62%). Seventy-eight percent of the respondents had either a bachelor's degree or postgraduate degree qualification. On average, the respondents had seven years of managerial experience (standard deviation = 4.87).

In all, 655 firms were randomly selected. The firms were contacted via telephone to obtain their consent for participation in the study. Subsequently, an introductory letter explaining the research objectives and assuring confidentiality was sent to these firms. A total of 362 of the firms contacted provided data for the study. Analysis of the initial data for incompleteness/missing data resulted in retaining 331 responses, representing an effective response rate of 50.53%. The study finds that 16.30% of the firms operate in the manufacturing industry while the remaining are service-based firms, which is reflective of the distribution of businesses in Ghana (Ghana Statistical Service, 2016). On average, a typical firm had operated for 12.60 years (standard deviation = 8.28) and had 55 full-time employees (standard deviation = 9.00).

3.2. Measures

3.2.1. Substantive Variables

Multi-item measures were developed based on existing scales identified in the literature. Where necessary, measures were adapted to reflect the key informants' understanding. Details of the items used to operationalize the constructs are reported in Table 1.

Operational performance was operationalized as the effectiveness of an organization in achieving its strategic goals in terms of its responsiveness to customer needs, reduction in lead time and time to market, improvement in processes, and on-time delivery of goods and services. Specific measures were adapted from Flynn, Huo, and Zhao (2010) and Panayides and Lun (2009). The items were captured on a 7-point Likert scale ranging from "1 (very dissatisfied)" to "7 (very satisfied)". *Governance mechanisms* was operationalized to comprise formal control and social control, and were adapted from Huang et al., (2014), Cai et al., (2009), and Homburg, Cannon, Krohmer, and Kiedaisch (2009). The items were anchored on a 7-point Likert scale ranging from "1 (not at all)" to "7 (extreme extent)". *Supply chain complexity* has been measured in a variety of ways in prior research: not only do different measurement items exist but also while some studies utilize psychometric scales (Chowdhury et al., 2019), others rely on objective scales, or both (Bozarth et al., 2009). This study follows a psychometric measurement approach by adapting three indicators from Bozarth et al., (2009): (1) number of customers served, (2) number of suppliers, and (3) number of product/service models produced outside the firm. The items were anchored on a 7-point rating scale ranging from "extremely low =1" to "extremely high = 7". We validated this data using objective indicators. We conducted follow-up interviews with 121 out of the 331 respondents, via telephone calls. The respondents were asked to indicate the (1) number of different key customer groups their firms have served in the last three years (mean = 5.01; SD = 2.13), (2) number of customer relationships their firms have actively managed in the last three years (21.45; SD = 6.45), (3) number of different supplier groups their firms have sourced inputs from in the last three years (mean = 2.56; SD = 1.45), (4) number of key supplier relationships that their firms have

actively managed in the last three years (mean = 4.74; SD = 3.164), and (5) number of unique products/services that their firms have offered in the last three years (mean = 3.87; SD = 1.96). Analysis of the data shows a high correlation between the two measurement approaches: $r = .86$; $p < .01$, suggesting a high degree of similarity between the two approaches to measuring supply chain complexity.

3.2.2. Control variables

Several variables were included as covariates in the analysis of the conceptual model. As indicated in prior studies (Narayanan & Narasimhan, 2014; Cao & Zhang, 2011; Hoetker & Mellewigt, 2009), relationship-specific investment and incentive alignment may affect GMs and operational performance. Accordingly, we controlled for these variables to partial out their potential effects on operational performance. Measures for both relationship-specific investment and incentive alignment were taken from Hoetker and Mellewigt (2009) and Cao and Zhang (2011) respectively. Both relationship-specific investment and incentive alignment were captured on a 7-point rating scale ranging from "1 (extremely low)" to "7 (extremely high)" and "1 (strongly disagree)" to "7 (strongly agree)" respectively. In addition, we controlled for the potential effects of firm industry (service = 1; manufacturing = 0), firm age (natural log of the total number of years in business), and firm size (natural log of the total number of full-time employees) (Huang et al., 2014).

Table 1: Validity and Reliability Results

Measures	Standardized Loadings	T-values
Formal control (CR = .85, AVE = .59, CA = .85)		
My organization ensures specific, well-designed agreements with its business partners	.74	Fixed
My organization ensures formal agreements that detail the obligations of all parties	.76	12.87
My organization ensures formally agreed set of rules to monitor our partner's actions[1]	—	—
My organization ensures compliance with contractual terms and conditions	.81	13.51
My organization makes reference to contracts to settle differences of opinion	.76	12.84
Social control (CR = .84, AVE = .52, CA = .84)		
My organization ensures trust building with its business partners	.74	Fixed
My organization ensures team building with its business partners	.73	12.29
My organization engages in joint planning with its business partners	.69	11.54
My organization engages in joint workshop /meetings with its business partners	.72	12.11
My organization arranges social events with its business partners	.71	11.92
Supply chain complexity (CR = .82, AVE = .60, CA =.82)		
The number of customers your organization serves	.77	Fixed
The number of suppliers your organization deals with	.84	12.79
The number of product/service models produced outside your organization	.72	12.03
Relationship-specific investment (CR = .87, AVE = .58, CA = .87)		
Knowledge about marketing and sales know-how	.75	Fixed
Knowledge about business planning and development networks	.82	14.26
Knowledge about business operations	.74	13.02
Knowledge about information and technology development	.71	12.36
Knowledge about customer care	.78	13.62
Incentive alignment (CR = .84, AVE = .58, CA = .84)		
My organization and its business partners evaluate each other's performance	.75	Fixed
My organization and its business partners share costs together	.82	14.26
My organization and its business partners share benefits together	.74	13.02
My organization and its business partners share risks that occur together	.71	12.36
The incentive for my organization commensurate with our investment and risks[1]	—	—
Operational performance (CR = .81, AVE = .51, CA = .81)		
Responsiveness to customer needs	.72	Fixed
Reduction in lead time	.71	11.10
Reduction in time-to-market[1]	—	—
Process improvement	.73	11.30
On-time deliveries	.70	10.94

Note: CR = composite reliability, AVE = average variance extracted, CA = Cronbach's alpha; [1] = failed in the CFA

3.3. Reliability and Validity Assessment

We assessed the validity and reliability of the scales using confirmatory factor analysis (CFA) in LISREL 8.5. A model purification process (via assessment of the modification indices [Hair, Black, Babin, & Anderson, 2014]) resulted in dropping one item each in the scales measuring formal

control, incentive alignment, and operational performance. The final six-factor CFA model fitted the data well: $\chi^2 = 286.91$, DF = 260, χ^2 /DF = 1.10, p = .12, RMSEA = .02, NNFI = .99, CFI = .99, SRMR = .04 (Hair et al., 2014). Table 1 presents the factor loadings and their associated t-values, alongside the composite reliability (CR), average variance extracted (AVE), and the Cronbach's alpha values. All loadings were above .60 and were significant at 1%. Additionally, the CR, AVE, and CA values were above their minimum thresholds of .60, .50, and .70 respectively (Hair et al., 2014; Bagozzi & Yi, 2012). These results demonstrate convergence validity and internal consistency of the scales. Also, the AVE values were greater than the shared variances between the scales, indicating that each scale demonstrates discriminant validity (Hair et al., 2014).

3.4. Common Method Bias Assessment

We performed two statistical tests to further rule out any existence of common method bias in the data. First, we used Harman's single factor technique to determine whether or not a single-factor fits the data (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Accordingly, we tested three competing CFA models: method-only, trait-only, and method and trait. In the method-only model, we linked all the items in the study onto a single latent construct, and as expected, the model fit was poor: $\chi^2 = 3962.18$, DF = 350, χ^2 /DF = 11.32, p = .000, RMSEA = .18, NNFI = .33, CFI = .38, SRMR = .14. Trait-only model was estimated by linking each item to its hypothesized latent construct, and a good model fit was obtained: $\chi^2 = 378.50$, DF = 335, χ^2 /DF = 1.13, p = .05, RMSEA = .02, NNFI = .98, CFI = .99, SRMR = .04. We then estimated a method and trait model in which single factor linking all the items in the trait-only model, also provided a marginal improvement in model fit indices over that of the trait-only model: $\chi^2 = 318.60$, DF = 301, χ^2 /DF = 1.06, p = .23, RMSEA = .01, NNFI = .99, CFI = .99, SRMR = .04. Second, in drawing insights from Lindell and Witney (2001), we further examined common method bias using the marker variable approach. The smallest positive correlation between the study variables (i.e., r = .03) was used as a proxy for common method variance (CMV) (Malhotra, Kim, & Patil, 2006). As reported in Table 2, the CMV-adjustment did not change the sign and significance level of any of the

Table 2: Descriptive Statistics and Correlation Results

Variables	1	2	3	4	5	6	7	8	9
1. Operational performance		.30**	.26**	.13*	.12*	.28**	.07	.04	-.06
2. Formal control	.32**		.41**	.00	.15**	.30**	.21**	.02	-.05
3. Social control	.28**	.43**		.14**	.14*	.20**	.05	.06	-.01
4. Supply chain complexity	.15**	.03	.17**		-.04	.22**	-.02	.06	-.00
5. Incentive alignment	.15**	.18**	.16**	-.01		.07	.03	-.03	.06
6. Relationship specific investment	.30**	.32**	.22**	.24**	.10		.16**	.10	-.13*
7. Firm size (log)	.10	.23**	.07	.01	.06	.18**		.33**	-.23**
8. Firm age (log)	.07	.05	.09	.09	.00	.12*	.35**		-.27**
9. Firm industry (service = 1)	-.03	-.01	.03	.03	.09	-.10	-.19**	-.23**	
Mean	5.06	5.02	4.88	5.10	4.29	5.11	3.33	2.40	.84
Standard deviation	.86	.98	.96	1.09	1.09	.78	1.06	.55	.37

Notes:

1. Correlations below the principal diagonal are before the common method variance (CMV)-adjustment.
2. CMV-adjusted correlations are reported above the principal diagonal. *$p < .05$ (two-tailed test). **$p < .01$ (two-tailed test).
3. N = 331.

correlations between the study variables, suggesting that method bias was not an issue in the data used in this study. These findings suggest that a single factor does not explain variances in the data.

4. Structural Model Estimation and Results

In following Baron and Kenny's (1986) recommendation and prior research (e.g., Poppo et al., 2016), we used the multiplicative approach to test the interaction effects of SCC, as SCC is captured as a continuous variable. This approach helps control for the main effect of SCC on operational performance. To address multicollinearity issues resulting from the use of multiplicative terms, the variables involved in the creation of the interaction terms were orthogonalized using the residual centering method (Little, Bovaird, & Widaman, 2006). We implemented the analysis using a covariance-based structural equation modeling in LISREL 8.50, which allowed us to simultaneously and hierarchically estimate the effects of the control variables, main effect variables, and interaction effect variable while taking into account measurement error (Hair et al., 2014). Subsequently, three nested models were estimated as follows:

Model 1: Control Effects Model:

$$OP = RSI + IA + FS + FA + FI + 0*FC + 0*SC + 0*SCC + 0*FC\times SCC + 0*SC\times SCC \quad (1)$$

Model 2: Main Effects Model:

$$OP = RSI + IA + FS + FA + FI + FC + SC + SCC + 0*(FC\times SCC) + 0*(SC\times SCC) \quad (2)$$

Model 3: Interaction Effects Model:

$$OP = RSI + IA + FS + FA + FI + FC + SC + SCC + FC\times SCC + SC\times SCC \quad (3)$$

Where OP = operational performance, RSI = relationship-specific investment, IA = incentive alignment, FS = firm size; FA = firm age; FI = firm industry (service =1), FC = formal control, SC = social control, SCC = supply chain complexity, FC×SCC = interaction between formal control and supply chain complexity, SC×SCC = interaction between social control and supply chain complexity.

The model fit indices and parameter estimates are reported in Table 3. The results show that all the three models fit the data well. In particular, Model 1 explains 13.10% variance in operational performance, and shows that relationship-specific investment ($\beta = .30$, $t = 4.43$) and incentive alignment ($\beta = .17$, $t = 2.57$) have significant positive associations with operational performance. Model 2 significantly improved the explanatory power of Model 1 by 9.80%, given $\Delta\chi^2 = 23.96$, $df = 3$, $p < .01$. Model 2 further reveals that formal control has a positive significant association with operational performance ($\beta = .25$, $t = 2.99$) and that of social control ($\beta = .14$, $t = 1.84$). SCC ($\beta = .11$, $t = 1.43$) is not significantly related operational performance. Additionally, the results show that Model 3 significantly fits the data better than Model 2, given a significant change in $\chi^2 = 23.43$, $df = 2$, $p < .01$; and $\Delta R^2 = 6.40\%$. Furthermore, the results indicate that increases in SCC and higher levels of formal control are associated with decreases in operational performance. This is demonstrated by the negative coefficient of the interaction between formal control and SCC ($\beta = -.16$, $t = -2.66$). This provides support for H1, which argues that at high levels of SCC, the effect of formal control on operational performance is weakened. Additionally, the results indicate that SCC positively moderates the effect of social control on operational performance ($\beta = .27$, $t = 4.50$); thus providing support for H2 which stated that the positive effect of social control on operational performance is strengthened at higher levels of SCC. As displayed in Figure 2 and Figure 3, the results indicate that formal control and social control have stronger positive effects on operational performance at low levels and high levels of SCC respectively.

Table 3: Results of Hypothesis Tests

Independent variables	**Standardized parameters (t-values)**		
	Model 1	Model 2	Model 3
Control effect paths:			
Relationship specific investment	.30(4.43)	.15(2.07)	.12(1.73)
Incentive alignment	.17(2.57)	.09(1.43)	.05(.86)
Firm size	.06(.92)	.00(.06)	-.00(-.06)
Firm age	.02(.38)	.02(.26)	.04(.67)
Firm industry (service =1)	.00(.05)	-.02(-.37)	.00(.07)
Main effect paths			
Formal control (FC)		.25(2.99)	.22(2.70)
Social control (SC)		.14(1.84)	.17(2.17)
Supply chain complexity (SCC)		.11(1.43)	.11(1.57)
Interaction effect paths (hypothesized)			
H1: FC × SCC			-.16(-2.66)
H2: SC × SCC			.27(4.50)
Goodness of fit indices:			
χ^2/DF	430.21/360 = 1.20	406.25/357 = 1.14	382.82/355 = 1.08
$\Delta\chi^2$(DF)	—	23.96(3)**	23.43(2)**
RMSEA	.02	.02	.02
NNFI	.97	.98	.99
CFI	.97	.98	.99
SRMR	.05	.04	.04
p-value	.01	.04	.15
R^2	13.10%	22.90%	29.30%
ΔR^2	—	9.80%	6.40%

Notes:

- Critical values for hypothesized paths = 1.645 (5%, one tailed test).
- Non-hypothesized paths are evaluated at 1.96 (5%, two-tailed test).
- N = 331.
- $^{**}p < .01$.

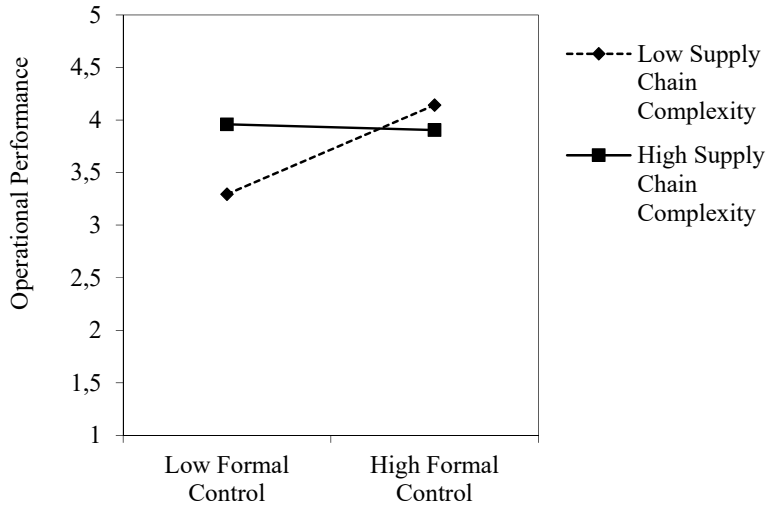

Figure 2: Interaction effects of formal control with supply chain complexity.

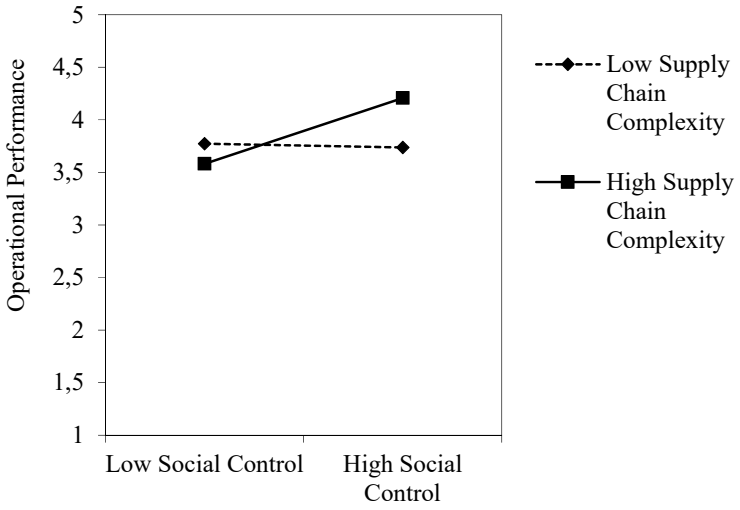

Figure 3: Interaction effect of social control with supply chain complexity.

5. Discussions and Implications

The purpose of the study is to explain the moderating role of SCC in the GMs-operational performance relationship. The theoretical and managerial implications of the findings are presented next.

5.1. Theoretical Implications

While interfirm governance literature argues in favor of formal control and social control as appropriate mechanisms for dealing with buyer-seller relationship problems such as uncertainty and opportunism (Huang et al., 2014; Wang et al., 2011), relatively little is known about the potential contingency role of SCC in the analysis of the GMs-performance link. This study draws on TCE to argue that increases in SCC weaken the effect of formal control mechanism while at the same time strengthening the effect of social control mechanism on operational performance. Thus, a major contribution from this study is its ability to account for the conditioning roles of SCC in the interfirm GMs–operational performance relationship.

Consistent with the study's predictions, findings from this study show different effects of formal control and social control mechanisms on operational performance at varying levels of SCC. Specifically, the findings show that at high levels of SCC, increases in the use of formal control are associated with a decline in operational performance, implying that under such conditions, the incremental benefit of formal control for driving operational performance is attenuated as SCC increases in magnitude. The underlying theoretical logic is that as interfirm relationship networks increase in complexity in terms of the number of ties and variety of products, and uncertainty amplifies, the controlling capacity of formal control declines as a result of its rigid nature. In addition, the scope of monitoring and supervision of contract executions, and associated cost of transaction increase (Wang et al., 2011), making an increased use of formal control less productive when SCC is high. In other words, formal control may boost operational performance particularly under conditions of low levels of SCC where the buyer-seller relationship context is more predictable and less complicated. This corroborates the notion that formal control is limited in its capacity to respond to uncertainty situations within interfirm exchanges (Cannon et al., 2000).

The results further show that, contrary to formal control, an increase in social control is associated with increases in operational performance at high levels of SCC. In particular, due to its self-enforcing and adaptive properties (Wang et al., 2011; Dyer & Singh, 1998), social control

becomes more efficient in enhancing operational performance when levels of SCC is high as it (social control) allows exchange partners to leverage greater flexibility for adaptation to the uncertainty and complications associated with greater SCC. This is consistent with Poppo et al.'s (2016) findings that the effect of calculative trust on performance is stronger when market uncertainty is lower while relational trust tends to drive performance under conditions of increased market uncertainty.

Theoretically, the study provides a more nuanced picture regarding the GMs-operational performance relationship by showing that the level of SCC associated with interfirm exchanges is key in determining the benefits of both formal control and social control in driving operational performance. Thus, the direct positive effects of formal control and social control on operational performance are dependent on how these control mechanisms are aligned with levels of SCC characterizing interfirm relationships.

5.2. Managerial Implications

The study informs managers that their firms are part of a broader network of inter-organizations that focus on delivering value to customers. While SCC is an inherent part of interfirm relationships (Christopher, 2012), how it influences GMs-operational performance relationship varies with different forms of GMs. As the results indicate, formal control proves more effective when the degree of SCC is low. This is because formal control thrives under relatively stable and predictable environments (Poppo et al., 2016). Additionally, using formal control as a mechanism to manage interfirm exchange hazards under high levels of complexity is likely to result in rather detailed and complex contractual arrangements that may be prohibitively costly to maintain, and merely "ritualize" the interfirm exchange governance process. The resultant high transaction cost characterizing the overutilization of formal control under such conditions undercuts its efficiency and performance-enhancing qualities.

On the other hand, since social control is flexible and allows for swift adaptation to uncertainties (Wang & Wei, 2007), it tends to be more efficient in driving operational performance

under conditions of high SCC. Thus, practically, our study suggests that different levels of SCC contribute differently to the relationship between different aspects of GMs and operational performance. Therefore, in making decisions regarding the use and configuration of GMs to manage buyer-seller relationships, managers should consider the degree of SCC characterizing their interfirm relationship networks and make an appropriate alignment to leverage resources from interfirm exchanges and extract superior operational performance.

5.3. Limitations and Avenues for Future Research

As with any research, the study's findings should be evaluated in light of some limitations, which are discussed to provide avenues for further research. First, the study relied on cross-sectional data to estimate the research model. While cross-sectional data are sufficient for explanatory research and are regularly used in governance research (Poppo et al., 2016; Huang et al., 2014), reliance on longitudinal data would have yielded results from which strong causal inferences could be made. Thus, while the current research has provided insights on how formal and social controls are related to operational performance under varying conditions of SCC, a viable avenue for future research is to use longitudinal research design to provide causal inferences on the relationships.

Second, the study conceptualized SCC in terms of the number of supply chain actors and products a focal firm manages. While this approach is in line with prior research (e.g., Lu & Shang, 2017; Bozarth et al., 2009), it ignores the degree of depth and interactivity aspects of SCC. Additional research is, therefore, needed to comprehensively conceptualize and operationalize the SCC construct from a broader perspective.

Third, the research was undertaken in a sub-Sahara African market, Ghana, with a high degree of institutional fluidity and uncertainty impacting on the variety of inter-organizational relationship forms and governance (Slade Shantz et al., 2020; Parente et al., 2019). While Ghana shares many characteristics with other developing economy countries and, therefore, offers a rich context to test our model from a developing economy perspective (Boso et al., 2013; Acquaah, 2007), other

developing countries may possess unique and varied contextual elements that allow for additional insights and theory development. Accordingly, we suggest that our model is extended to other markets by comparing data across a range of developing and developed economies for additional insight. For example, which GM would be ideal for organizations competing in institutionally developed versus institutionally developing markets? This may be a question that may motivate future research efforts.

6. Conclusion

On the premise that SCC has not been given sufficient scholarly attention in the analysis of GMs–performance nexus, this study examined how SCC moderates the extent to which formal and social controls become more or less instrumental in deriving operational performance. Based on the empirical results, we conclude that whereas the positive relationship between formal control and operational performance is strengthened at low levels of SCC, the instrumental benefit of social control for enhancing operational performance becomes salient at high levels of SCC. Thus, the findings shed insight on how the operational performance consequences of formal control and social control mechanisms vary under differing levels of SCC.

7. References

Abdi, M., & Aulakh, P. S. (2012). Do country-level institutional frameworks and inter-firm governance arrangements substitute or complement in international business relationships? *Journal of International Business Studies*, 43(5), 477-497.

Acquaah, M. (2007). Managerial social capital, strategic orientation, and organizational performance in an emerging economy. *Strategic Management Journal*, 28, 1235-1255.

Adler, P. S. (2001). Market, hierarchy, and trust: The knowledge economy and the future of capitalism. *Organization Science*, 12(2), 215-234.

Adomako, S., Danso, A., & Ofori Damoah, J. (2016). The moderating influence of financial literacy on the relationship between access to finance and firm growth in Ghana. *Venture Capital*, 18(1), 43-61.

Adomako, S., Opoku, R. A., & Frimpong, K. (2018). Entrepreneurs' improvisational behaviour and new venture performance: Firm-level and institutional contingencies. *Journal of Business Research*, 83, 10-18.

African Development Bank Group (2018). African Economic Outlook: Ghana. (Accessed January 22, 2020). Available at https://www.afdb.org/fileadmin/uploads/afdb/.../Generic.../Ghana_country_note.pdf.

African Development Bank Group (2020). 2020 African economic outlook: Developing Africa's workforce for the future. (Accessed 5, January 2020). Available at: https://www.afdb.org/en/knowledge/publications/african-economic-outlook.

Aldrich, J.E. (1979). Organizations and Environments. Englewood Cliffs: Prentice-Hall.

Amankwah-Amoah, J., Debrah, Y. A., & Nuertey, D. (2018). Institutional legitimacy, cross-border trade and institutional voids: Insights from the cocoa industry in Ghana. *Journal of Rural Studies*, 58, 136-145.

Bagozzi, R. P., & Yi, Y. (2012). Specification, Evaluation, and Interpretation of Structural Equation Models. *Journal of the Academy of Marketing Science,* 40 (1), 8-34.

Banin, Y. A., Boso, N., Hultman, M., Souchon, A. L., Hughes, P., & Nemkova, E. (2016). Salesperson improvisation: Antecedents, performance outcomes, and boundary conditions. *Industrial Marketing Management*, 59, 120-130.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173.

Bode, C., & Wagner, S.M. (2015). Structural drivers of upstream supply chain complexity and the frequency of supply chain disruptions. *J. Operations Management*, 36, 215-228.

Boso, N., Cadogan, J. W., & Story, V. M. (2013). Entrepreneurial orientation and market orientation as drivers of product innovation success: A study of exporters from a developing economy. *International Small Business Journal*, 31(1), 57-81.

Boso, N., Donbesuur, F., Bendega, T., Annan, J., & Adeola, O. (2017). Does organizational creativity always drive market performance? *Psychology & Marketing*, 34(11), 1004-1015.

Bozarth, C. C., Warsing, D. P., Flynn, B. B., & Flynn, E. J. (2009). The impact of supply chain complexity on manufacturing plant performance. *Journal of Operations Management*, 27(1), 78-93.

Brinks, D., Leiras, M., & Mainwaring, S. (Eds.). (2014). *Reflections on Uneven Democracies: The Legacy of Guillermo O'Donnell.* Baltimore: John Hopkins University Press.

Burkert, M., Ivens, B.S., & Shan, J. (2012). Governance mechanisms in domestic and international buyer–supplier relationship: An empirical study. *Industrial Marketing Management*, 41(3), 544–546.

Cai, S., Yang, Z., & Hu, Z. (2009). Exploring the governance mechanisms of quasi-integration in buyer-supplier relationships. *Journal of Business Research*, 62(6), 660-666.

Campbell, D. (1988). Task complexity: A review and analysis. *The Academy of Management Review*, 13 (1), 40–52.

Cannon, J. P., Achrol, R. S., & Gundlach, G. T. (2000). Contracts, norms, and plural form governance. *Journal of the Academy of Marketing Science*, 28(2), 180-194.

Cao, M., & Zhang, Q. (2011). Supply chain collaboration: Impact on collaborative advantage and firm performance. *Journal of Operations Management*, 29(3), 163-180.

Cao, Z., & Lumineau, F. (2015). Revisiting the interplay between contractual and relational governance: A qualitative and meta-analytic investigation. *Journal of Operations Management*, 33, 15-42.

Carson, S. J., Madhok, A., & Wu, T. (2006). Uncertainty, opportunism, and governance: The effects of volatility and ambiguity on formal and relational contracting. *Academy of Management Journal*, 49(5), 1058-1077.

Cavusgil, S. T., Deligonul, S., & Zhang, C. (2004). Curbing foreign distributor opportunism: An examination of trust, contracts, and the legal environment in international channel relationships. *Journal of International Marketing*, *12*(2), 7-27.

Child, J. (1972). Organizational Structure. Environment, and Performance: The Role of Strategic Choice. *Sociology*, 6 (1), 1-22.

Choi, T.Y., & Krause, D.R. (2006). The supply base and its complexity: implications for transaction costs, risks, responsiveness, and innovation. *J. Operations Management*, 24 (5), 637-652.

Chowdhury, M. M. H., Quaddus, M., & Agarwal, R. (2019). Supply chain resilience for performance: role of relational practices and network complexities. *Supply Chain Management: An International Journal*, 24(5), 659-676.

Christopher, M. (2012). Managing supply chain complexity: identifying the requisite skills. *Supply Chain Forum: An International Journal,* 13, (2), 4-9.

Claycomb, C., & Frankwick, G. L. (2010). Buyers' perspectives of buyer–seller relationship development. *Industrial Marketing Management*, 39(2), 252-263.

Coase, R.H. (1937). The nature of the firm. *Econometrica*, 4 (16), 386-405.

Coltman, T., Bru, K., Perm-Ajchariyawong, N., Devinney, T. M., & Beniot, G. R. (2009). Supply chain contract evolution. *European Management Journal*, 27(6), 388-401.

Conner, K. R. (1991). A historical comparison of resource-based theory and five schools of thought within industrial organization economics: Do we have a new theory of the firm?. *Journal of Management*, 17(1), 121-154.

Crocker, K. J., & Masten, S. E. (1991). Pretia ex machina? Prices and process in long-term contracts. *The Journal of Law and Economics*, 34(1), 69-99.

Dadzie, K. Q., Winston, E., & Hinson, R. (2015). Competing with Marketing Channels and Logistics in Africa's Booming Markets: An Investigation of Emerging Supply Chain Management Practices in Ghana. *Journal of Marketing Channels*, 22(2), 137-152.

Dyer, J. H., & Chu, W. (2003). The role of trustworthiness in reducing transaction costs and improving performance: Empirical evidence from the United States, Japan, and Korea. *Organization Science*, 14(1). 57-68.

Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of inter-organizational competitive advantage. *Academy of Management Review*, 23(4), 660-679.

El Baz, J., Laguir, I., & Stekelorum, R. (2019). Logistics and supply chain management research in Africa. *The International Journal of Logistics Management*, 30 (1), 8-38.

Ferguson, R. J., Paulin, M., & Bergeron, J. (2005). Contractual governance, relational governance, and the performance of interfirm service exchanges: The influence of boundary-spanner closeness. *Journal of the Academy of Marketing Science*, 33(2), 217-234.

Flynn, B. B., Huo, B., & Zhao, X. (2010). The impact of supply chain integration on performance: a contingency and configuration approach. *Journal of Operations Management*, 28(1), 58-71.

Ghana Statistical Service (2016).Integrated business establishment survey: regional spatial business report. (Accessed 15 May 2019). Available at: http://www.statsghana.gov.gh/gssmain/fileUpload/pressrelease/REGIONAL%20SPATIAL%20BUSINESS%20REPORT.pdf

Gulati, R. (1998). Alliances and networks. *Strategic Management Journal*, 19(4), 293-317.

Hair, J. F. J., Black, C. W., Babin, J. B. & Anderson, E. R. (2014). *Multivariate Data Analysis*. Edinburgh Gata, Harlow: Pearson Education.

Haugland, S. A. (1999). Factors influencing the duration of international buyer–seller relationships. *Journal of Business Research*, 46(3), 273-280.

Hawkins, T. G., Wittmann, C. M., & Beyerlein, M. M. (2008). Antecedents and consequences of opportunism in buyer–supplier relations: Research synthesis and new frontiers. *Industrial Marketing Management*, 37(8), 895-909.

Hitt, M. A., Hoskisson, R. E., & Kim, H. (1997). International diversification: Effects on innovation and firm performance in product-diversified firms. *Academy of Management Journal*, 40(4), 767-798.

Hoetker, G., & Mellewigt, T. (2009). Choice and performance of governance mechanisms: matching alliance governance to asset type. *Strategic Management Journal*, 30(10), 1025-1044.

Homburg, C., Cannon, J. P., Krohmer, H., & Kiedaisch, I. (2009). Governance of international business relationships: A cross-cultural study on alternative governance modes. *Journal of International Marketing*, 17(3), 1-20.

Huang, M. C., Cheng, H. L., & Tseng, C. Y. (2014). Reexamining the direct and interactive effects of governance mechanisms upon buyer-supplier cooperative performance. *Industrial Marketing Management*, 43(4), 704-716.

Huber, T.L., Fischer, T.A., Dibbern, J., Hirschheim, R. (2013). A process model of complementarity and substitution of contractual and relational governance in IS outsourcing. *JMIS*, 30, 81-114.

Ivens, B. S., & Blois, K. J. (2004). Relational exchange norms in marketing: a critical review of Macneil's contribution. *Marketing Theory*, 4(3), 239-263.

Jacobs, M. A., & Swink, M. (2011). Product portfolio architectural complexity and operational performance: Incorporating the roles of learning and fixed assets. *Journal of Operations Management*, 29(7-8), 677-691.

Jayaraman, V., Narayanan, S., Luo, Y., & Swaminathan, J. M. (2013). Offshoring Business Process Services and Governance Control Mechanisms: An Examination of Service Providers from I ndia. *Production and Operations Management*, 22(2), 314-334.

John, G. (1984). An empirical investigation of some antecedents of opportunism in a marketing channel. *Journal of Marketing Research*, 21, 278-289.

Joshi, A. W., & Stump, R. L. (1999). 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. *Journal of the Academy of Marketing Science*, 27(3), 291.

Li, Y., Xie, E., Teo, H. H., & Peng, M.W. (2010). Formal control and social control in domestic and international buyer-supplier relationships. *Journal of Operations Management*, 28(4), 333-344.

Little, T. D., Bovaird, J. A., & Widaman, K. F. (2006). On the merits of orthogonalizing powered and product terms: Implications for modeling interactions among latent variables. *Structural Equation Modeling*, 13(4), 497-519.

Liu, Y., Li, Y., & Zhang, L. (2010). Control mechanisms across a buyer–supplier relationship quality matrix. *Journal of Business Research*, 63(1), 3-12.

Lindell, M. K., & Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology*, 86 (1), 114-21.

Lu, G., & Shang, G. (2017). Impact of supply base structural complexity on financial performance: Roles of visible and not-so-visible characteristics. *Journal of Operations Management*, 53, 23-44.

Lu, P., Guo, S., Qian, L., He, P., & Xu, X. (2015). The effectiveness of contractual and relational governances in construction projects in China. *International Journal of Project Management*, 33(1), 212-222.

Malhotra, N. K., Kim, S. S., & Patil, A. (2006). Common method variance in IS research: A comparison of alternative approaches and a reanalysis of past research. *Management Science*, 52(12), 1865-1883.

Manuj, I., & Sahin, F. (2011). A model of supply chain and supply chain decision-making complexity. *International Journal of Physical Distribution & Logistics Management*, 41(5), 511-549.

Martinez, J. I., & Jarillo, J. C. (1989). The evolution of research on coordination mechanisms in multinational corporations. *Journal of International Business Studies*, 20(3), 489-514.

Mazzocchi, F. (2008). Complexity in biology: Exceeding the limits of reductionism and determinism using complexity theory. *EMBO Reports*, 9 (1), 10-14.

Narayanan, S., & Narasimhan, R. (2014). Governance choice, sourcing relationship characteristics, and relationship performance. *Decision Sciences*, 45(4), 717-751.

Noordewier, T. G., John, G., & Nevin, J. R. (1990). Performance outcomes of purchasing arrangements in industrial buyer-vendor relationships. *Journal of Marketing*, 54(4), 80-93.

Novak, S., & Eppinger, S. D. (2001). Sourcing by design: Product complexity and the supply chain. *Management Science*, 47(1), 189-204.

Olander, H., Hurmelinna-Laukkanen, P., Blomqvist, K., & Ritala, P. (2010). The dynamics of relational and contractual governance mechanisms in knowledge sharing of collaborative R&D projects. *Knowledge and Process Management*, 17(4), 188-204.

Osmonbekov, T., Gregory, B., Chelariu, C., & Johnston, W. J. (2016). The impact of social and contractual enforcement on reseller performance: the mediating role of coordination and inequity during adoption of a new technology. *Journal of Business & Industrial Marketing*, 31(6), 808-818.

Panayides, P. M., & Lun, Y. V. (2009). The impact of trust on innovativeness and supply chain performance. *International Journal of Production Economics*, 122(1), 35-46.

Parente, R., Rong, K., Geleilate, J. M. G., & Misati, E. (2019). Adapting and sustaining operations in weak institutional environments: A business ecosystem assessment of a Chinese MNE in Central Africa. *Journal of International Business Studies*, 50(2), 275-291.

Penttinen, E., & Palmer, J. (2007). Improving firm positioning through enhanced offerings and buyer–seller relationships. *Industrial Marketing Management*, 36(5), 552-564.

Podsakoff, P.M., MacKenzie, S.B., Lee, J., & Podsakoff, N.P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, 88(5), 879-903.

Poppo L., & Zenger T. (2002). Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal* 23(8), 707-725.

Poppo, L., Zhou, K. Z., & Li, J. J. (2016). When can you trust "trust"? Calculative trust, relational trust, and supplier performance. *Strategic Management Journal*, 37(4), 724-741.

Reuer, J.J., & Ari˜no, A. (2007). Strategic alliance contracts: dimensions and determinants of contractual complexity. *Strategic Management Journal*, 28(3), 313-330.

Rhee, J. H., Kim, J. W., & Lee, J. H. (2014). Interaction effects of formal and social controls on business-to-business performance. *Journal of Business Research*, 67(10), 2123-2131.

Rothaermel, F. T., Hitt, M. A., & Jobe, L. A. (2006). Balancing vertical integration and strategic outsourcing: effects on product portfolio, product success, and firm performance. *Strategic Management Journal*, 27(11), 1033-1056.

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review*, 23(3), 393-404.

Rutenberg, D.P., & Shaftel, T.L. (1971). Product design: subassemblies for multiple markets. *Management Science*, 18 (4), 220-231.

Ryall, M. D., & Sampson, R. C. (2009). Formal contracts in the presence of relational enforcement mechanisms: Evidence from technology development projects. *Management Science*, 55(6), 906-925.

Sanchez, R., & Mahoney, J. T. (1996). Modularity, flexibility, and knowledge management in product and organization design. *Strategic Management Journal*, 17(S2), 63-76.

Simon, H. A. (1982). *Models of bounded rationality. vol. 2, Behavioral economics and business organization*. MIT Press.

Slade Shantz, A. F., Kistruck, G. M., Pacheco, D. F., & Webb, J. W. (2020). How formal and informal hierarchies shape conflict within cooperatives: A field experiment in Ghana. *Academy of Management Journal*, 63(2), 503-529.

Tatikonda, M.V., & Stock, G.N. (2003). Product technology transfer in the upstream supply chain. *The Journal of Product Innovation Management*, 20 (6), 444-467.

Thorgren, S., & Wincent, J. (2011). Interorganizational trust: Origins, dysfunctions and regulation of rigidities. *British Journal of Management*, 22(1), 21-41.

Uniform Commercial Code (1978). American Law Institute and the National Conference of Commissioners on Uniform State Laws.

Wacker, J. G., Yang, C., & Sheu, C. (2016). A transaction cost economics model for estimating performance effectiveness of relational and contractual governance: Theory and statistical results. *International Journal of Operations & Production Management*, 36(11):1551-1575.

Wang, E. T., & Wei, H. L. (2007). Interorganizational governance value creation: coordinating for information visibility and flexibility in supply chains. *Decision Sciences*, 38(4), 647-674.

Wang, L., Yeung, J. H. Y., & Zhang, M. (2011). The impact of trust and contract on innovation performance: The moderating role of environmental uncertainty. *International Journal of Production Economics*, 134(1), 114-122.

Wathne, K. H., & Heide, J. B. (2000). Opportunism in inter-firm relationships: Forms, outcomes, and solutions. *Journal of Marketing*, 64(4), 36-51.

Whetten, D. A., & Aldrich, H. (1979). Organization setsize and diversity: people-processing organizations and their environments. *Administration & Society*, 11(3), 251-281.

Williamson, O. E. (1975). *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: Free Press.

Williamson, O. E. (1985). *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. New York: The Free Press.

Williamson, O. E. (1991). Comparative economic organization: The analysis of discrete structural alternatives. *Administrative Science Quarterly*, 269-296.

World Bank. (2017). Annual report 2017, World Bank, accessed December 19, available at http://pubdocs.worldbank.org/en/908481507403754670/Annual-Report-2017-WBG.pdf

Zhang, J., & Keh, H. T. (2010). Inter-organizational exchanges in China: Organizational forms and governance mechanisms. *Management and Organization Review*, 6(1), 123-147.