How interfirm governance mechanisms and capabilities determine supply chain responsiveness in small businesses: Evidence from an African market

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Abstract

This paper examines whether supply chain capabilities (i.e. collaboration and coordination) mediate the relationships between interfirm governance mechanisms (i.e. formal control and social control) and supply chain responsiveness in the context of small businesses. Using survey data from 331 small businesses in Ghana, we find that interfirm governance mechanisms are not directly related to supply chain responsiveness. Additional results show that interfirm governance mechanisms have positive indirect relationships, via supply chain capabilities, with supply chain responsiveness. Overall, this paper offers an improved understanding of how interfirm governance mechanisms might contribute to supply chain responsiveness in small businesses.

Keywords: formal control and social control; supply chain responsiveness; collaboration and coordination; small businesses; Ghana

1. Introduction

Small businesses contribute significantly to socio-economic development (Okoumba et al., 2020; Stekelorum, 2020; Acquaah & Agyapong, 2015). Supply chain literature suggests that in today's fast-changing and competitive environment, supply chain responsiveness is critical for small businesses to establish footholds in the marketplace (Yang et al., 2019; Kumar & Singh, 2017). Supply chain responsiveness, the degree to which a firm addresses diverse customer needs in a time-effective manner, enhances customer value, competitive advantage, and profitability (Giannakis et al., 2019; Yang et al., 2019).

From transaction cost economics and relational exchange perspectives, prior research indicates that interfirm governance mechanisms (IGMs), comprising formal control (i.e. contractual agreements) and social control (i.e. informal relationship-building), can drive supply chain responsiveness (Um & Oh, 2020; Tse et al., 2019; Huang et al., 2014). An argument is that IGMs could help reduce opportunism and its associated relational hazards inherent in supply chain relationships (Um & Oh, 2020; Hawkins et al., 2008). However, literature also indicates that IGMs alone do not always benefit interfirm relationship performance outcomes (Tse et al., 2019; Anin et al., 2016; Osmonbekov et al., 2016; Huang et al., 2014; Li et al., 2010; Hoetker & Mellewigt, 2009). Moreover, previous research says little about how small businesses can utilize IGMs to improve performance (Cao et al., 2018).

The supply chain perspective of resource-based view argues that collaboration and coordination are important supply chain capabilities for attaining competitive advantage (Adams et al., 2014; Gligor & Holcomb, 2012; Cao & Zhang, 2011). In particular, the issue of liability of smallness demands that small businesses develop and deploy such capabilities in order to be successful (Okoumba et al., 2020; Kumar & Singh, 2017; Cao & Zhang, 2011). Coordination smoothens interdependencies, increases visibility, and reduces bottlenecks within supply chains (Gligor & Holcomb, 2012; Arshinder et al., 2011). In contrast,

collaboration enables firms to effectively execute supply chain operations and obtain relational rents (Kumar & Singh, 2017; Um & Kim, 2017). Prior research findings suggest that these capabilities could drive supply chain responsiveness (Um & Oh, 2020; Um & Kim, 2019; Singh et al., 2018; Adams et al., 2014; Gligor & Holcomb, 2012; Cao & Zhang, 2011). Meanwhile, other scholars contend that IGMs can foster collaboration and coordination since they reduce uncertainties and opportunism in exchange relationships (Um & Oh, 2020; Gulati et al., 2012; Arshinder et al., 2011; Fawcett et al., 2008). However, there is a dearth of empirical knowledge of whether collaboration and coordination mediate the relationships between IGMs and supply chain responsiveness in small businesses.

This paper extends resource-based view to transaction cost economics and relational exchange literature to develop and test a conceptual model to detail how collaboration and coordination might translate IGMs into enhanced supply chain responsiveness in small businesses. Based on survey data from Ghana, the study finds that leveraging IGMs through collaboration and coordination enhances supply chain responsiveness. Along these lines, this paper makes two key contributions. First, by analyzing the mediating roles of collaboration and coordination in the links between IGMs and supply chain responsiveness, we broaden the limited empirical understanding of the mechanisms that explain the performance effects of IGMs (Um & Oh, 2020; Cao & Lumineau, 2015; Wang & Wei, 2007). Second, we enrich contextual perspectives on IGMs, collaboration and coordination, and supply chain responsiveness, which remain underdeveloped in small businesses (Cao et al., 2018; Kumar & Singh, 2017) and African markets (Okoumba et al., 2020; El Baz et al., 2019). While responding to calls on researchers to explore further the performance consequences of IGMs and supply chain capabilities in different contexts (Um & Oh, 2020; Um & Kim, 2019), we additionally shed light on how firms could bundle IGMs with collaboration and coordination to improve supply chain responsiveness. With the lack of research on supply chain

management issues and models for explaining supply chain performance outcomes in African markets a key concern (El Baz et al., 2019; Mellahi & Mol, 2015), this paper offers an important step.

2. Theoretical Background and Hypothesis Development

2.1. Interfirm Governance Mechanisms

IGMs refer to the underlying and concrete management and control activities utilized to regulate and influence interfirm relationship behaviors to achieve desired outcomes (Hoetker & Mellewigt, 2009). Transaction cost economics (TCE) literature suggests that opportunism is inherent in interfirm relationships and can jeopardize relationship success (Hawkins et al., 2008; John, 1984). Therefore, firms are motivated to use IGMs in their supply chains to discourage opportunism and ensure compliance and commitment to achieve relationship goals (Williamson, 1975; Huang et al., 2014).

While there could be different shades of IGMs (see Gilliland et al., 2010), the literature largely agrees that the core ones include formal control and social control (Huang et al., 2014; Hoetker & Mellewigt, 2009). From TCE standpoint, formal control represents appropriate IGM where terms and conditions for exchange are clearly defined for the exchange parties (Hawkins et al., 2008). Formal control refers to "written regulations, objectives, rules and obligations that specify the expected behavior, processes and output standards explicitly within the contract" (Huang et al., 2014, p. 704). On the other hand, the relational exchange (RE) perspective suggests social control as an alternate approach for inspiring trust and commitment to discourage opportunism in exchange relationships (Joshi & Stump, 1999; Morgan & Hunt, 1994). Social control refers to relational or people-based practices utilized to manage exchange relationships (Huang et al., 2014; Hoetker & Mellewigt, 2009).

Recent metanalytic studies (Cao et al., 2018; Cao & Lumineau, 2015) reveal a substantial body of research on IGMs. However, insight from Cao et al. (2018) indicates a paucity of knowledge of the roles of IGMs in small businesses. Although Cao and Luminueu (2015) find that IGMs generally enhance relationship performance, specific studies (Osmonbekov et al., 2016; Huang et al., 2014; Li et al., 2010; Hoetker & Mellewigt, 2009) report mixed and inconsistent findings. Rindfleisch et al. (2008) propose that one way to minimize competing explanations in casual-based theoretical models is to incorporate relevant mediating variables. A mediating variable offers an alternate approach for modeling the "concept of fit" and its consequences (Venkatraman, 1989). This perspective specifies the existence of a significant intervening mechanism between an antecedent variable and its outcome variable (Venkatraman, 1989). Accordingly, we argue that how IGMs influence performance may better be understood when relevant processes linking these variables are not merely assumed but specified theoretically and empirically. In this study, collaboration and coordination are proposed as supply chain-level intervening factors that explain how IGMs might derive supply chain responsiveness.

2.2. Supply Chain Capabilities: Collaboration and Coordination

An extensive body of research has examined the notions of collaboration and coordination in the field of supply chain management (Singh et al., 2018; Kumar & Singh, 2017; Arshinder et al., 2011). However, the conceptual domains of these concepts are vague (Gao et al., 2018; Cao & Zhang, 2011; Simatupang et al., 2002) and scholars often use the terms interchangeably (Li et al., 2018; Lavikka et al., 2015). For instance, Li et al. (2018, p. 1) define coordination as "the collaboration degree between the manufacturer and its supply chain partners and among its internal functions". Nevertheless, it appears that the term "collaboration" is used in a broader sense (Cao & Zhang, 2011; Kim & Lee, 2010; Min et al.,

2005). Other literature highlights that collaboration is an essential antecedent of coordination (Singh et al., 2018; Arshinder et al., 2011; Kim & Lee, 2010).

Cao and Zhang (2011) and Min et al. (2005) found that the notion of collaboration has two conceptual components: process focus and relationship focus. The process focus component reflects the extent to which supply chain partners work jointly to solve problems and execute supply chain operations (Simatupang et al., 2002). Among other things, the idea of "work jointly" in this definition involves joint problem-solving, joint decision-making (Min et al., 2005), and sharing of resources (e.g. information) and responsibilities (Fawcett et al., 2008; Simatupang et al., 2002). On the other hand, the relationship focus component focuses on the formation of interfirm relationships (e.g. two or more firms partnering to execute a particular project) (Min et al., 2005). Integrating these views, Cao and Zhang (2011, p. 166) define collaboration as "a partnership process where two or more autonomous firms work closely to plan and execute supply chain operations toward common goals and mutual benefits". Based on this definition, the authors conceptualize collaboration as comprising information sharing, goal congruence, decision synchronization, incentive alignment, resource sharing, collaborative communication, and joint knowledge creation. However, other studies (e.g. Adams et al., 2014) have conceptualized and operationalized collaboration as a unidimensional concept. Adams et al. (2014) view collaboration as involving the joint sharing of responsibilities and benefits arising from the relationship. Along this line, and following the process view of collaboration, this study operationalizes collaboration as a unidimensional construct. Specifically, we consider collaboration as the degree to which supply chain actors work jointly to devise and implement better approaches to solving problems and delivering the value customers expect (Fawcett et al., 2008). This definition implies that collaboration involves the extent to which supply chain actors make joint decisions, share resources, and work together in performing supply chain-related

activities (Fawcett et al., 2008). On the other hand, coordination is defined as the alignment of efforts, activities, and flows within supply chains. In other words, it is about the extent to which supply chain transactions are seamlessly managed (Gulati et al., 2012; Gligor & Holcomb, 2012).

Prior research shows that several performance benefits are associated with collaboration and coordination: efficiency performance, delivery performance, flexibility performance, quality performance, collaborative and transaction cost advantage, innovation performance, and financial performance (Um & Oh, 2020; Um & Kim, 2019; Li et al., 2018; Adams et al., 2014; Gligor & Holcomb, 2012; Cao & Zhang, 2011). However, frameworks for facilitating collaboration and coordination, and accordingly supply chain responsiveness, are scarce in the context of small businesses in developing markets (Kumar & Singh, 2017) and Africa (El Baz et al., 2019). Our conceptual framework, illustrated in Figure 1, responds to this and the afore-mentioned knowledge gaps. Specifically, it suggests that collaboration and coordination positively mediate the relationships between IGMs and supply chain responsiveness. To provide a foundation for this overarching hypothesis, we first develop a series of hypotheses linking the predictor variables to the mediating variables and also, the mediating variables to the outcome variable.

--- Insert Figure 1 about here ----

2.3. Effects of Interfirm Governance Mechanisms on Supply Chain Capabilities

Formal control can enhance collaboration for several reasons. First, the punitive element in formal control prevents supply chain partners from pursuing their selfish interests (Um & Oh, 2020; Um & Kim, 2019). Formal control ensures compliance and helps exchange parties to overcome opportunistic behaviors that undermine collaborative initiatives in supply chains (Anin et al., 2016; Lumineau & Malhotra, 2011; Li et al., 2010). Second, in a manufacturer-

channel member relationship, formal control can address issues relating to delivery times, quantity flexibility, quantity and price discounts, reservation policy, sales rebate, buyback, and revenue sharing (Dekker et al., 2019; Arshinder et al., 2011). In so doing, formal control clarifies the rights and responsibilities of parties in an exchange relationship. Lack of clarity of obligations and rights could be demotivating and may ruin collaborative actions (Um & Kim, 2019). Third, formal control could minimize and resolve conflicts, enabling exchange partners to collaborate more effectively. Additionally, formal control can help manufacturer-channel member relationships set aside cultural and goal differences that restrain effective collaboration (Gulati et al., 2012). Consistent with these arguments, Um and Oh (2020) found that formal control enhances collaboration.

In manufacturer-channel member relationships, formal control provides the parameters (e.g. quantity, price, time, quality) within which channel members place orders and manufacturers fulfill accordingly (Arshinder et al., 2011). Knowing what is expected from each supply chain actor makes it easy for them to align end-to-end supply chain activities (Um & Kim, 2019). Moreover, manufacturer-channel member relationships can deploy formal control to standardize and streamline supply chain transactions. These facilitate coordination as they minimize uncertainties and ambiguities that sometimes characterize supply chain transactions (Gulati et al., 2012). Therefore, we test the following hypotheses:

Hypothesis 1a. Formal control has a positive relationship with collaboration.

Hypothesis 1b. Formal control has a positive relationship with coordination.

Like formal control, social control is a critical tool for driving collaboration and coordination (Um & Kim, 2019; Gulati et al., 2012; Hoetker & Mellewigt, 2009; Fawcett et al., 2008). Social control promotes mutual understanding and reduces divergent interests and goals in

exchange relationships, affording successful collaboration to occur (Um & Kim, 2019). A high level of informal relationships and interactions between supply chain partners minimizes relational risks and conflicts. It creates a sense of mutuality that inspires the parties' willingness to work together (Zhang & Keh, 2010; Wang & Wei, 2007). Social control assumes that supply chain partners would, out of trust, commitment, and loyalty, be willing to collaborate in problem-solving, decision-making, and planning and work together to attain joint objectives (Huang et al., 2014; Wang & Wei, 2007).

Also, repeated friendly interactions between supply chain partners, resulting from social control, foster coordination (Hoetker & Mellewigt, 2009). Moreover, social control promotes an understanding regarding how each party's roles and activities contribute to collective goals and why synchronizing the parties' individual activities achieves such goals. Further, social control, through cooperative norms, reduces uncertainties and dysfunctional conflicts, strengthening coordination efforts (Hoetker & Mellewigt, 2009). These arguments lead to the following hypotheses:

Hypothesis 1c. Social control has a positive relationship with collaboration.

Hypothesis1d. Social control has a positive relationship with coordination.

2.4. Effects of Supply Chain Capabilities on Supply Chain Responsiveness

In the face of rapid changes in customer needs, which are influenced by competition and globalization, manufacturers deem it strategically imperative to partner with channel members to improve supply chain responsiveness (Giannakis et al., 2019; Yang et al., 2019; Kim & Lee, 2010). Supply chain responsiveness is a measure of how well a manufacturer swiftly addresses wide and varied needs of customers (Yang et al., 2019; Kim & Lee, 2010).

Resource-based view (RBV) literature (Barney, 1991) suggests that inter-organizational routines such as collaboration and coordination are important resources for supply chain actors to gain competitive advantage (Adams et al., 2014; Gligor & Holcomb, 2012; Cao & Zhang, 2011). Unlike tangible resources that can easily be acquired, collaboration and coordination capabilities can be difficult to duplicate or imitate as their nature is ambiguous to parties external to the focal supply chain network (Barney, 1991). In particular, for small firms in developing markets, firm resources underlying these supply chain capabilities may not be homogeneous. As boundary-spanning capabilities (Fawcett et al., 2008; Simatupang et al., 2002), collaboration and coordination enable supply chain actors to exploit opportunities that generate relational rents (Adams et al., 2014; Gligor & Holcomb, 2012; Cao & Zhang, 2011). Further, collaboration and coordination are necessary for smoothening dependencies within supply chains that often result in vulnerabilities and underperformance (Gulati et al., 2012; Arshinder et al., 2011).

Particularly, collaboration helps supply chain partners to work towards achieving a common goal. For example, supply chain partners can take joint decisions on critical matters to improve relational performance and initiate joint actions to achieve them (Kim & Lee, 2010). In the face of supply chain disruptions, collaboration between supply chain partners is necessary for quick restoration of operations (Christopher & Peck, 2004), which improves supply chain responsiveness. Besides, where a channel member engages in effective collaboration with its supplier, the latter is likely to be satisfied and respond swiftly to fulfill the needs of the former (Jayaram et al., 2011). Prior studies have found that collaboration positively affects collaborative advantages (Cao & Zhang, 2011), supply chain responsiveness (Kim & Lee, 2010), and logistics service capabilities (measured in terms of delivery performance and quicker to-market development of new products) (Adams et al., 2014).

Coordination is also a critical resource for enhancing supply chain responsiveness (Kumar & Singh, 2017). Gligor and Holcomb (2012) found that coordination correlates positively with the focal firm's agility and operational performance. Also, Jayaram et al. (2011) reported that supplier coordination and customer coordination improve flexibility performance. The logic is that lack of coordination increases operational bottlenecks and delays, lowering supply chain responsiveness (Kumar & Singh, 2017; Gligor & Holcomb, 2012). Short and reliable lead-times are likely to be high within supply chains that have seamless and synchronized operations. These arguments and prior research findings suggest the following hypotheses:

Hypothesis 2a. Collaboration has a positive relationship with supply chain responsiveness.

Hypothesis 2b. Coordination has a positive relationship with supply chain responsiveness.

2.5. Mediating Roles of Supply Chain Capabilities

Integrating hypotheses 1a-d and hypotheses 2a-b, we expect that the influence of IGMs on supply chain responsiveness would occur through collaboration and coordination. This expectation is consistent with prior research findings that certain firm/interfirm level intervening variables may be required to translate IGMs into performance. For example, Wang and Wei (2007) found that information visibility mediates the link between social control and supply chain flexibility performance; Um and Oh (2020) demonstrated that collaboration mediates the links between IGMs and operational performance; Cao and Lumineau (2015) reported that relational norms and trust mediate the formal control-relationship performance link.

Lack of strategic direction, managerial competencies, and appropriate information technologies generally render small businesses in underdeveloped markets less effective in developing collaboration and coordination capabilities (Kumar & Singh, 2017). Nonetheless, we contend that significant variances in the intensity of collaboration and coordination would occur under such conditions. Precisely, as argued in hypotheses 1a-d, we expect that greater use of IGMs would improve collaboration and coordination. Issues such as opportunism, lack of clarity and specificity of roles, conflicting interests, goal incongruence, and inconsistent metrics, which are common in supply chains, can suppress the willingness and effort of supply chain actors to collaborate and coordinate in meaningful ways (Gulati et al., 2012; Fawcett et al., 2008; Gligor & Holcomb, 2012; Arshinder et al., 2011). Therefore, with IGMs having the capacity to mitigate such collaboration and coordination challenges, firms aiming to increase the benefits of these capabilities may be emboldened to emphasize IGMs when pursuing collaboration and coordination initiatives. Similarly, firms that emphasize IGMs might be motivated to intensify collaboration and coordination thresholds, which might augment their capacity to rapidly fulfil customer orders.

The inherent issue of opportunism in supply chains may amplify in underdeveloped markets due to weak and deficient institutional mechanisms in such environments (Amankwah-Amoah et al., 2018). Meanwhile, deficient institutional mechanisms might further undermine contract enforcement and promote taken-for-granted behaviors, raising concerns about whether IGMs themselves are sufficient for achieving competitive advantage and superior supply chain performance outcomes in developing markets. Under such situations, we perceive that it may not be enough for firms to emphasize IGMs: they should also position themselves strategically to extract the benefits of IGMs fully. In hypotheses 2a-b, we have argued that collaboration and coordination are relevant capabilities for driving supply chain responsiveness (Um & Kim, 2019; Singh et al., 2018; Adams et al., 2014;

Gligor & Holcomb, 2012; Cao & Zhang, 2011). Therefore, since IGMs attenuate collaboration and coordination problems (Gulati et al., 2012; Fawcett et al., 2008), the positive effects of IGMs on supply chain responsiveness would manifest through collaboration and coordination. Formally, we test the following hypotheses:

Hypothesis 3a. Formal control has a positive indirect relationship, via collaboration, with supply chain responsiveness.

Hypothesis 3b. Formal control has a positive indirect relationship, via coordination, with supply chain responsiveness.

Hypothesis 3c. Social control has a positive indirect relationship, via collaboration, with supply chain responsiveness.

Hypothesis 3d. Social control has a positive indirect relationship, via coordination, with supply chain responsiveness.

3. Research Design

3.1. Empirical Setting

To test our research model, we relied on survey data from the sachet and bottled water (SBW) industry in Ghana. Specifically, we focused on the relationships between manufacturers and autonomous channel members (distributors/wholesalers). The SBW industry in Ghana is a young and fast-growing context dominated by small businesses at both the manufacturing and physical distribution stages (Wardrop et al., 2017), making it a suitable empirical setting for examining our research hypotheses.

Over the past decade, the consumption rate of SBW has increased substantially as the sector fills the water supply gap in the West-African region (Guzmán & Stoler, 2018). Due to

its availability, portability, and ease of handling, most people in the sub-region have become oriented towards SBW consumption. In Ghana, about 63.0% and 4.1% of households consume sachet water and bottled water, respectively. Also, about 22.5 million water sachets are consumed daily (Wardrop et al., 2017). Given the essential nature of SBW and its increasing market demand (Morinville, 2017; Wardrop et al., 2017), the sector has become an essential driver of Ghana's socio-economic development.

On the back of the increased demand for SBW in recent times, firms participating in the manufacturer-channel member relationship have increased in number substantially (Morinville, 2017). This has intensified competition at both the manufacturing and distribution stages. Unlike the manufacturers, the channel members do not have a size or private-label advantage. Instead, some have a greater channel advantage that allows them to decide which brands to sell. However, their disproportionately large number restrains them from gaining excessive power. Further, a few manufacturers have well-established brands (Quansah et al., 2015). Additionally, the manufacturers compete intensely for a large share of the consumer market and strategic distribution outlets. Weak brands in the industry have low consumer preference. To keep such brands competitive in the marketplace, they are sold to channel members at relatively low prices. Typically, the channel members attempt to minimize overall input costs and, at the same time, sell more by dealing in different combinations of strong and weak brands.

3.2. Measures

Table 1 displays the measures used to capture the study constructs.

3.2.1. Substantive Variables

We adapted four items from Anin et al. (2016), Huang et al. (2014), and Cai et al. (2009) to measure formal control (α = .950). All items were evaluated using a seven-point scale that ranged from "strongly disagree (=1)" to "strongly agree (=7)". Unlike formal control, prior studies have not been clear on the measures for social control. Consistent with Hoetker and Mellewigt (2009), we viewed social control in terms of social-based activities leading to the creation of trust, rather than trust *per se*. Social control is "reflected in the structure and processes in place to facilitate socialization between the buyer and the seller" (Huang et al., 2014, p. 708). Not only may the "structure and processes…" be several but also, they could be context-specific. For example, some studies (Huang et al., 2014; Hoetker & Mellewigt, 2009) have focused on 'formal' business activities such as participation in project groups, committees, conferences, workshops, joint-team building exercises to measure the construct. However, from our preliminary fieldwork, we realized that items of these kinds do not apply to the research context. Hence, we dwelled on the central idea of informal relationships and social interactions implicit in the notion of social control (Liu et al., 2017) to generate four items to measure the construct (α = .852). The items were anchored on a seven-point scale: "strongly disagree (=1)" to "strongly agree (=7)". Four items were adapted from Adams et al. (2014) and Gligor and Holcomb (2012) to measure collaboration (alpha = .888). Three items were adapted from Sezen (2008) and Gilliland et al. (2010) to measure coordination (α = .892). The items for both collaboration and coordination were anchored on a seven-point scale: "not at all (=1)" to "to a largest extent (=7)". Four items were adapted from Kim and Lee (2010) and Handfield and Bechtel (2002) to measure supply chain responsiveness (α = .835). A seven-point scale that ranged from "much worse (=1)" to "much better (=7)" (compared to the performance of other suppliers) was used to evaluate the items.

3.2.2. Control Variables

We included buyer dependence, channel advantage, and relationship experience in the models of collaboration, coordination, and supply chain responsiveness as control variables. Additionally, we controlled for the potential influence of collaboration on coordination. Buyer dependence refers to the extent to which a buyer firm recognizes the need to continue and preserve its business relationship with a seller firm to attain its business goals (Ryu et al., 2007; Gulati & Sytch, 2007). Buyer dependence may motivate the buyer firm to initiate and sustain collaboration and coordination efforts with the seller firm as doing so allows it to secure relevant inputs (Ryu et al., 2007). Four items were adapted from Cai et al. (2009) and Gulati and Sytch (2007) to measure buyer dependence (α = .861) using a seven-point scale that ranged from "strongly disagree (=1)" to "strongly agree (=7)".

Channel advantage refers to the degree to which the seller firm values the buyer firm's position in the channel of distribution. High levels of channel advantage increase seller dependence. This can foster the seller firm's effort to effectively collaborate with the buyer firm and ensure coordinated operations. Also, channel advantage can compel manufacturers to be swifter in addressing channel members' needs as doing so helps them (manufacturers). We developed three items (α = .900) to measure channel advantage using a seven-point scale that ranged from "strongly disagree (=1)" to "strongly agree (=7)".

Relationship experience (i.e. the duration of the relationship) shapes the effectiveness of interfirm interactions and reduces perceptions of opportunistic behaviors (Hoetker & Mellegwigt, 2009). To this end, relationship experience can drive collaboration, coordination, and supply chain responsiveness. Relationship experience was measured in terms of the relationship age (in years): less than one year (=1), one to three years (=2), four to six years (=3), seven to nine years (=4), ten or more years (=5).

Coordination may be difficult to achieve when there is a high emphasis on 'local optimization' within the supply chain. Engaging in joint problem-solving, joint decision-making, and responsibility and resource sharing allows supply chain actors to synchronize supply chain activities effectively. Thus, it can be expected that coordination will increase with increases in collaboration (Singh et al., 2018).

3.3. Data and Data Collection

We used primary data to test the research hypotheses as we could not readily obtain secondary data on the variables of interest (Klingebiel & Stadler, 2015). Consistent with prior studies on supplier-channel member relationships (Samaha et al., 2011; Griffith et al., 2006), we collected the data from the channel members. The lack of comprehensive and accurate databases of businesses in Ghana is a significant challenge for developing an appropriate sampling frame (Boso et al., 2013). To implement the study, we focused on channel members operating in two geographical regions in Ghana (i.e. Ashanti Region and Greater Accra Region), where most of the industry's major players operate (Wardrop et al., 2017; Morinville, 2017).

We relied on a face-to-face questionnaire administration approach to collect the data (Klingebiel & Stadler, 2015). We first demarcated the geographical context of the study into smaller areas. Next, we assigned ten fieldworkers (postgraduate students) to specific areas to administer the questionnaire. This was done to avoid duplicate responses from the field (Acquaah & Agyapong, 2015). Forty questionnaires were sent out by each field worker and collected later. After few follow-ups, three hundred and fifty-one of the questionnaires were received within ten working days. After a preliminary examination of the questionnaires received, three hundred and thirty-one were considered usable for the study. The overall response rate was 82.75%. 35.3% and 34.1% of the firms had "one to three" years and "four

to six" years of relationship experience, respectively. Also, 35.3% of the firms had been in business for about four to six years. An average firm's workforce size was about four (standard deviation = 3.433).

The questionnaires were administered to owner-managers in the firms. An average respondent had held his/her current position for 4.3 years. Our preliminary fieldwork suggested that a substantial proportion of the target respondents had low educational background (i.e. below bachelor level). Accordingly, we trained the field workers on how to professionally assist such respondents (where necessary) in obtaining responses devoid of interviewer bias. We further created a variable to separate all interviewer-assisted questionnaires (Method 1) from self-administered questionnaires (Method 2). This was done to enable us to statistically examine whether the two data collection approaches introduced bias in the data. 53.8 percent of the data were collected using Method 1. A t-test conducted revealed no statistically significant differences in the data obtained using Method 1 and Method 2: supply chain responsiveness (mean difference = -.155; t = -1.333), collaboration (mean difference = -.034; t = -.191), coordination (mean difference = -.172; t = -1.602), formal control (mean difference = .232; t = 1.053), social control (mean difference = .133; t = .906), buyer dependence (mean difference = -.065, t = -.430), channel advantage (mean difference = .042, t = .292), and relationship experience (mean difference = -.211, t = -1.887). Accordingly, the data were pooled together to estimate the research model.

3.4. Measure Validation and Common Method Bias Assessment

We implemented covariance-based confirmatory factor analysis (CFA) along with maximum likelihood estimation in LISREL 8.5 to assess the validity of the measurement indicators (Bagozzi & Yi, 2012; Hair et al., 2014). As shown in Figure 2, we estimated a seven-factor CFA model with each item specified to load onto its theoretical construct. After inspecting

the model modification indices (Hair et al., 2014), we dropped one item each from collaboration, formal control, social control, and supply chain responsiveness scales, resulting in a satisfactory model fit to data: χ^2 =416.11, df = 188, χ^2/df = 2.213, RMSEA = .061; NNFI = .940, CFI = .952, SRMR = .049 (Bagozzi & Yi, 2012; Hair et al., 2014). Table 1 presents the factor loadings (and their associated t-values), composite reliability (CR), and average variance extracted (AVE) values. The satisfactory model fit indices, together with each item loading significantly on its specified construct, demonstrate convergent validity (Hair et al., 2014). To assess discriminant validity, we computed AVE values and compared them with the shared variances between the constructs (Hair et al., 2014). All AVEs obtained were above the minimum threshold of .50 and were larger than the shared variances between each pair of constructs. This demonstrates the distinctiveness of the scales and thus suggests that discriminant validity was attained in the study (Hair et al., 2014). Also, all CR values were above .60, indicating satisfactory construct reliability (Bagozzi & Yi, 2012; Hair et al., 2014).

We followed several procedural remedies suggested by Podsakoff et al. (2003) to minimize the tendency of common method bias in the study: we utilized different scale anchors; we avoided indicating the construct names and the relationships being tested in the study so as to minimize consistency motif and illusory correlations; we introduced temporal breaks in the questionnaire by placing the items for the predictor, mediator, and outcome variables apart and introducing other items in between them. Further, the instrument contained several other items that made it difficult for the respondents to comprehend the hypotheses tested in the study.

Notwithstanding, we conducted relevant statistical tests to examine the extent to which common method bias might be present in the data. We compared our proposed measurement model (i.e. trait model) to an alternate model (i.e. method model) (Cote & Buckley, 1987) to examine common method bias. The method model was estimated by

linking all the measures onto a single latent factor: χ^2 = 4930.65, df= 299, χ^2/df = 16.490, RMSEA = .217, NNFI = .296, CFI = .353, SRMR = .155; while the trait model was estimated by linking each set of measures onto their proposed latent factors: χ^2 = 871.82, df = 278, χ^2/df= 3.136, RMSEA = .080, NNFI = .889, CFI = .905, SRMR = .057. It is noticeable that the trait model is significantly superior to the method model. This indicates that common method bias does not describe the data. We investigated CMB further using Lindell and Whitney's (2001) marker variable technique. We used the smallest positive correlation among the study constructs as a marker variable proxy to compute adjusted correlations among the constructs (Malhotra et al., 2006). The adjustment did not change the zero-order correlations (see Table 1), further indicating that CMB is not a major concern in the study.

--- Insert Figure 2 and Table 1 about here ----

4. Structural Model Estimation and Results

Table 2 displays the descriptive statistics for and correlations between the study variables. We relied on covariance-based structural equation modeling (SEM) and maximum likelihood estimator (in LISREL 8.5) to analyze our conceptual model. SEM is useful for controlling for measurement errors and testing models involving complex dependence relationships (Hair et al., 2014; Baggozi & Yi, 2012). It further provides a more straightforward test of mediation models (Baggozi & Yi, 2012). We assessed the robustness of the SEM results for H3a-d using PROCESS for SPSS as it enables researchers to test the statistical significance of mediation effects using bootstrapping procedures (Hayes, 2018).

--- Insert Table 2 about here ----

We followed a SEM-based approach to testing mediation models implemented in Lu et al. (2010). As detailed in Table 3, we analyzed six competing models. The first was a

baseline model (i.e. Model 0: the proposed full mediation model with the control variables). The direct paths from the predictor variables (formal control and social control) to the outcome variable (supply chain responsiveness) were constrained to zero. This model fitted the data well: $\chi^2 = 434.51$, df = 205, $\chi^2/df = 2.120$, RMSEA = .058, NNFI = .940, CFI = .951, SRMR = .048. The results displayed in Table 4 show that formal control positively affects collaboration ($\beta = .33$, $t = 6.27$, $p < .01$) and coordination ($\beta = .15$, $t = 2.97$, $p < .01$), in support of hypothesis 1a and hypothesis 1b, respectively. Further, the results revealed that social control has positive effect on collaboration ($\beta = .39$, $t = 6.37$, $p < .01$) but no effect on coordination ($\beta = -.05$, $t = -.91$, $p > .05$). Therefore, hypothesis 1c is supported while hypothesis 1d is rejected. Moreover, collaboration ($\beta = .19$, $t = 1.89$, $p < .05$) and coordination ($\beta = .23$, $t = 2.42$, $p < .01$) were found to have positive effects on responsiveness, supporting hypothesis 2a and hypothesis 2b respectively.

--- Insert Table 3, Table 4, and Figure 3 about here ----

Next, four competing models (Model 1, Model 2, Model 3, and Model 4) were estimated in which the four mediating effect paths in Model 0 were alternatively constrained to zero. As shown in Table 3, the fit indices for each of these models were significantly worse than those of Model 0, suggesting the existence of the hypothesized mediating effects. Model 5, a partial mediation model (included the direct effect paths from formal control and social control to supply chain responsiveness), also showed a good fit to data: $\chi^2 = 434.28$, df = 203, $\chi^2/df = 2.139$, RMSEA = .059, NNFI = .939, CFI = .951, SRMR = .048. Yet, it was not statistically different from the full mediation model: $\Delta\chi^2 = .230$, $p > .05$. Comparing the results of the partial and the full mediation models, we settled on the latter since it is not only parsimonious, but also the direct paths from the predictor variables to the outcome variable were not statistically different from zero (Table 4 and Figure 3).

As shown in Table 5, a further analysis using PROCESS reveals that formal control has a significant positive indirect effect on supply chain responsiveness via collaboration (indirect effect = .0304, 95% bootstrap confidence interval: .0060 to .0618) and coordination (indirect effect = .0172; 95% bootstrap confidence interval: .0034 to .0423), in support of hypothesis 3a and hypothesis 3b. The PROCESS results again indicate that social control has a significant positive indirect effect on supply chain responsiveness via collaboration (indirect effect = .0494; 95% confidence interval: .0099 to .1035) and that social control does not have a significant indirect effect on supply chain responsiveness via coordination (indirect effect = .0050; 95% bootstrap confidence interval = -.0167 to .0161). These results support hypothesis 3c and reject hypothesis 3d.

---- Insert Table 5 about here ----

5. Discussion

This research developed a conceptual model to investigate the linkages among IGMs (formal control and social control), supply chain capabilities (collaboration and coordination), and supply chain responsiveness in small businesses in an African market. Specifically, using survey data from manufacturer-channel member supply chains in Ghana, we test three set of hypotheses: IGMs are positively related to supply chain capabilities; supply chain capabilities are positively related to supply chain responsiveness; IGMs have indirect positive relationships, via supply chain capabilities, with supply chain responsiveness. In what follows, we discuss the theoretical and managerial implications of the study findings alongside limitations and avenues for further research.

5.1. Theoretical Implications

While TCE, RE, and RBV lines of reasoning provide different explanations to why some supply chains may outperform others, this study suggests that integrating these theoretical perspectives may provide a better understanding of the sources of heterogeneity in supply chain performance outcomes. Grounding formal control and social control within TCE and RE perspectives respectively, and collaboration and coordination within RBV, we theorize that superior supply chain responsiveness may result from deploying formal control and social control through collaboration and coordination. Empirical results from the study largely support this proposition.

Consistent with TCE and RE arguments that formal control and social control are respectively important strategies for mitigating collaboration and coordination problems, which often result from opportunistic behaviors (Gulati et al., 2012; Fawcett et al., 2008; Arshinder et al., 2011), the study findings indicate that by emphasizing IGMs, small businesses may be more effective in increasing collaboration and coordination. The study found that both formal control and social control have significant positive effects on collaboration. Additional results show that only formal control has a significant positive effect on coordination. Nonetheless, the results further show that collaboration has a significant positive influence on coordination, which implies that the influence of social control on coordination may work through collaboration. This finding suggests that, unlike formal control, social control alone may be less effective in directly driving coordination. Greater adherence to procedures and standard of operations is necessary to foster coordination. In this sense, formal control, as it involves explicit specification of terms and conditions for exchange (Huang et al., 2014), can be expected to be more efficacious in driving coordination. In collectivist societies (e.g. Ghana), social control may be predisposed to taken-for-granted attitudes such as negligence, compromise of responsibilities, abuse of

privileges, and impunity (Anin et al., 2016). Thus, in the absence of the intervening condition of collaboration, social control itself might contribute little to coordination.

In turn, the study found that both collaboration and coordination exert significant positive influence on supply chain responsiveness. These findings lend credence to the supply chain perspective of RBV which asserts that collaboration and coordination are critical boundary spanning capabilities for fostering the competitiveness of supply chains and firms (Um & Oh, 2020; Cao & Zhang, 2011; Gligor & Holcomb, 2012). Collaboration and coordination reduce the downsides of 'silo' and local optimization effects, which undermine supply chain performance. Collaboration helps supply chain actors extract, share, and leverage important resources (e.g. information, expertise) while coordination enables supply chains to reduce bottlenecks and increase visibility. These could facilitate supply chain responsiveness.

Extant literature somehow assumes that supply chains involving small businesses can be more responsive due to their inherent flexibility (Kumar & Singh, 2017; Reid et al., 2016; Thakkar et al., 2008). While this is likely, this study clarifies that there could be heterogeneity in their supply chain responsiveness, which is significantly accounted for by collaboration and coordination. Results indicate that a greater degree of collaboration or coordination is associated with a greater supply chain responsiveness. These findings are consistent with prior research (e.g. Um & Oh, 2020; Cai & Zhang, 2011; Kim & Lee, 2010; Gligor & Holcomb, 2012; Jayaram et al., 2011). Yet, the study further found that heterogeneity in the extent of collaboration and coordination results from differences in the extent of use of IGMs, particularly formal control. This suggests that in as much as collaboration and coordination are important sources of competitive advantage (Um & Oh, 2020; Um & Kim, 2019; Singh et al., 2018; Adams et al., 2014; Cao & Zhang, 2011) in the

context of small businesses (Kumar & Singh, 2017), downplaying the roles of IGMs can be detrimental.

Additional results from the study reveal that formal control and social control have no direct effects on supply chain responsiveness. These findings are in line with Hoetker and Mellewigt (2009) but contradict Cao and Lumineau (2015) and Huang et al. (2014). The results, however, reveal that formal control and social control have significant indirect, positive relationships, via collaboration, with supply chain responsiveness; and that formal control, but not social control, has a significant indirect positive relationship, via coordination, with supply chain responsiveness. These findings generally corroborate studies that report that IGMs may have indirect effects on performance (Cao & Lumineau, 2015; Wang & Wei, 2007).

In summary, the present study demonstrates how collaboration and coordination act as supply chain-level generative processes via which different IGMs might uniquely influence supply chain responsiveness. While some prior studies (Huang et al., 2014; Wang & Wei, 2007; Cao & Lumineau, 2015) have revealed that formal control and social control directly affect interfirm relationship performance outcomes, our results indicate that neither of these IGMs directly relates to supply chain responsiveness, after accounting for the intervention forces of collaboration and coordination. Per the propositions and findings from this study, we perceive that failing to incorporate relevant intervening factors in the IGMs-performance links can mask the performance implications IGMs in certain contexts.

5.2. Managerial Implications

Understanding how formal control and social control contribute to supply chain responsiveness in small businesses is a critical component of building and preserving the competitiveness and long-term survival of these firms. The study shows that while formal

control and social control are essential for small businesses, they might be insufficient for boosting supply chain responsiveness. Evidence from the study suggests that management in these firms need to deploy formal control and social control through collaboration to enhance supply chain responsiveness. The study again finds that formal control, when leveraged through coordination, enhances supply chain responsiveness. In line with these findings, practitioners within the research setting should be aware that introducing formal control and social control into interfirm relationships may not automatically translate into improved supply chain responsiveness. However, their ability to draw on formal control and social control to facilitate collaboration and coordination is more crucial. Collaboration and coordination are critical competitive advantage enhancers. Yet, different and incompatible interests and goals, as well as opportunistic behaviors, which are likely to emerge in interfirm relationships, can undermine the strategic value of collaboration and coordination in the absence of formal control and social control. Given the critical roles of collaboration and coordination in linking IGMs to supply chain responsiveness, managers are encouraged to focus more on developing and utilizing collaboration and coordination capabilities.

5.3. Limitation and Direction for Future Research

The study has limitations and avenues for improvement. Our conceptual model limits supply chain capabilities to collaboration and coordination as mediating variables in the IGMs-supply chain responsiveness linkages. Further studies can extend or modify our research model by considering other dependency-reduction capabilities such as information sharing. Similarly, other intermediate outcomes of formal and social controls (e.g. supply chain member satisfaction) could be studied as mediators in the research model. Moreover, our analysis of the performance consequence of IGMs was at the manufacturer-channel member relationship level. Future research could integrate firm-level performance outcomes into our

research model. Besides, future research could explore firm-specific and supply chain level contingencies that might condition the hypothesized indirect relationships in our model.

Data for the study came from one industry in a single country. While this controls for exogenous factors that may mask the hypothesized relationships, it limits the generalizability of the study results. Institutional and macro-level factors that influence firm strategies and performance differ across developing markets and within Africa (Mellahi & Mol, 2015). Therefore, our conceptual model should be tested in other industries and countries. Moreover, the cross-sectional nature of our data limits causal inferences. Lastly, though our unit of analysis is a dyad supply chain relationship, due to implementation challenges that were encountered, we followed prior research (Samaha et al., 2011; Griffith et al., 2006) to collect data from only one side of the relationship. We encourage future studies to address these methodological challenges.

6. Conclusion

Supply chain responsiveness is critical for increasing the competitiveness and growth of small businesses. This research demonstrates that small businesses in a developing market can increase supply chain responsiveness by deploying IGMs through collaboration and coordination.

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Table 1. Validity results.

Construct/measures	Loadings	T-values
Buyer dependence (CR = .864, AVE = .615)		
Our key supplier is crucial to our future performance	.734	Fixed
It would be difficult for us to replace the products of our key supplier	.859	14.62
It has cost us a lot to build relationships with our key supplier	.703	12.15
We feel our business will go down if we switch and sell the products of other suppliers	.829	14.25
Channel advantage (CR = .905, AVE = .760)		
We have established a unique distribution outlet for which our key supplier values	.857	Fixed
Our outlet is respected by our key supplier	.932	21.42
Our key supplier admires our business position in its distribution channel	.822	18.57
Collaboration (CR = .848, AVE = .651). We and our key supplier…		
collaborate in planning and decision making*		
engage in joint-problem solving	.733	14.41
work hand-in-hand to improve business operations	.854	Fixed
offer assistance and support to each other	.829	16.62
Coordination (CR = .893, AVE = .736). Regarding our relationship with our key supplier,		
business processes and activities of each of us are linked	.786	Fixed
efforts are coordinated	.890	17.74
products flows are coordinated	.893	17.79
Formal control (CR = .945, AVE = .852). Regarding our dealings with our key supplier,		
there exist well-designed agreements*		
there exist formal agreements that detail the obligations of each party	.949	Fixed
clear punishments are set to be inflicted on a party who fails to comply to terms	.899	28.42
there exist formal structures that ensure compliance	.922	30.61
Social control (CR = .851, AVE = .656). Regarding our dealings with our key supplier,		
informal relationship building is encouraged	.805	Fixed
social interactions are introduced into business transactions	.845	15.12
friendly environment is created to guard the relationship	.779	14.31
promises are honored because of social aspects of the relationship created*		
Supply chain responsiveness (CR = .801, AVE = .579). Compared to other suppliers, how would you rate your key supplier in terms of…		
Speed in replenishing our stock*		
Consistency in the speed of delivering products to us	.602	Fixed
Speed in responding to the changes in the market (i.e. customer requirements)	.841	10.44
Flexibility in responding to our changing requirements	.816	10.43

Notes:

1. *Item did not pass the CFA.
2. Loadings are significant at 1%.
3. CR = composite reliability, AVE = average variance extracted.

Table 2. Correlations and descriptive statistics.

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. Supply chain responsiveness		.360**	.387**	.174*	.138**	.220**	.340**	.169**
2. Collaboration	.364**		.561**	.349**	.384**	.268**	.300**	.179**
3. Coordination	.391**	.564**		.367**	.237**	.359**	.377**	.207**
4. Formal control	.179**	.353**	.371**		.000	.077	.177**	.121*
5. Social control	.143**	.388**	.242**	.006		.218**	.286**	-.018
6. Buyer dependence	.225**	.272**	.363**	.083	.223**		.274**	-.027
7. Channel advantage	.344**	.304**	.381**	.182**	.290**	.278**		.154*
8. Relationship experience	.174**	.184**	.212**	.126*	-.012	-.021	.159**	
Mean	5.48	4.45	4.79	3.87	5.35	5.16	5.52	2.51
Standard deviation	1.055	1.636	1.469	2.001	1.33	1.374	1.311	1.018

Notes:

1. Unadjusted and marker-variable adjusted correlations have been reported below and above the principal diagonal.
2. $^{*}p < .05$(2-tailed). $^{**}p < .01$ (2-tailed).

Table 3. Results of competing model analysis.

Model	χ^2	df	χ^2/df	$\Delta\chi^2$	Δdf	RMSEA	NNFI	CFI	SRMR
Baseline model (m0)	434.51	205	2.120			.058	.940	.951	.048
Model 1 (m1)	476.66	207	2.303	(m0, m1) = 42.15**	2	.063	.930	.943	.068
Model 2 (m2)	468.46	207	2.263	(m0, m2) = 33.95**	2	.062	.929	.942	.066
Model 3 (m3)	446.61	207	2.158	(m0, m3) = 12.10**	2	.059	.937	.948	.052
Model 4 (m4)	442.14	207	2.136	(m0, m4) = 7.63*	2	.059	.939	.950	.050
Model 5 (m5)	434.28	203	2.139	(m0, m5) = .230	2	.059	.939	.951	.048

Notes:

1. Baseline model: full mediation model (direct paths from formal control and social control to supply chain responsiveness were constrained to zero) with control variables.
2. Model 1: the path linking formal control to supply chain responsiveness via collaboration was constrained to zero.
3. Model 2: the path linking formal control to supply chain responsiveness via coordination was constrained to zero.
4. Model 3: the path linking social control to supply chain responsiveness via collaboration was constrained to zero.
5. Model 4: the path linking social control to supply chain responsiveness via coordination was constrained to zero.
6. Model 5: partial mediation model (paths in the baseline model plus direct paths from formal control and social control to supply chain responsiveness were all freely estimated).
7. $^{*}p < .05$, $^{**}p < .01$.

Table 4. SEM results.

	Dependent variables					
	Full mediation model			Partial mediation model		
Independent Variables	Collaboration	Coordination	Supply chain responsiveness	Collaboration	Coordination	Supply chain responsiveness
Control paths						
Relationship experience	.14(2.80)	.09(1.93)	.10(1.78)	.14(2.80)	.09(1.93)	.10(1.37)
Buyer dependence	.17(2.88)	.19(3.60)	.07(1.09)	.17(2.87)	.19(3.60)	.08(1.14)
Channel advantage	.08(1.38)	.17(3.20)	.16(2.37)	.08(1.37)	.17(3.20)	.17(2.48)
Collaboration		.49(6.85)			.49(6.84)	
Hypothesized paths						
Formal control	.33(6.27)	.15(2.97)		.33(6.27)	.15(2.97)	-.01(-.15)
Social control	.39(6.36)	-.05(-.91)		.39(6.37)	-.05(-.91)	-.05(-.74)
Collaboration			.15(1.78)			.19(1.89)
Coordination			.24(2.60)			.23(2.42)
Goodness of fit indices:						
R^2	.412	.536	.259	.413	.535	.263
χ^2/df	434.51/205 = 2.120			434.28/203 = 2.139		
$\Delta\chi^2$(df)				.230 (2), p > .05		
RMSEA	.058			.059		
NNFI	.940			.939		
CFI	.951			.951		
SRMR	.048			.048		

Notes:

1. Standardized parameter estimates (t-values) have been reported in the table. Critical value for evaluating the hypothesized paths is 1.645 (5%, 1-tailed).
2. Critical value for evaluating non-hypothesized paths is 1.96 (5%, 2-tailed).

Table 5. Results of indirect effect test.

Indirect effect path	Mediator	Effect	Boot SE[†]	95% CI
Formal control → Supply chain responsiveness	Collaboration	.0304	.0142	.0060 to .0618
	Coordination	.0172	.0095	.0034 to .0423
	Collaboration + Coordination	.0587	.0157	.0310 to .0929
Social control → Supply chain responsiveness	Collaboration	.0494	.0234	.0099 to .1035
	Coordination	.0050	.0079	-.0167 to .0161
	Collaboration + Coordination	.0679	.0261	.0236 to .1292

Notes

1. Covariates in models of mediators and outcome: buyer dependence, channel advantage, and relationship experience, and alternately, formal control and social control. Also, the path from collaboration to coordination is controlled.
2. [†]Number of bootstrap samples = 5000.

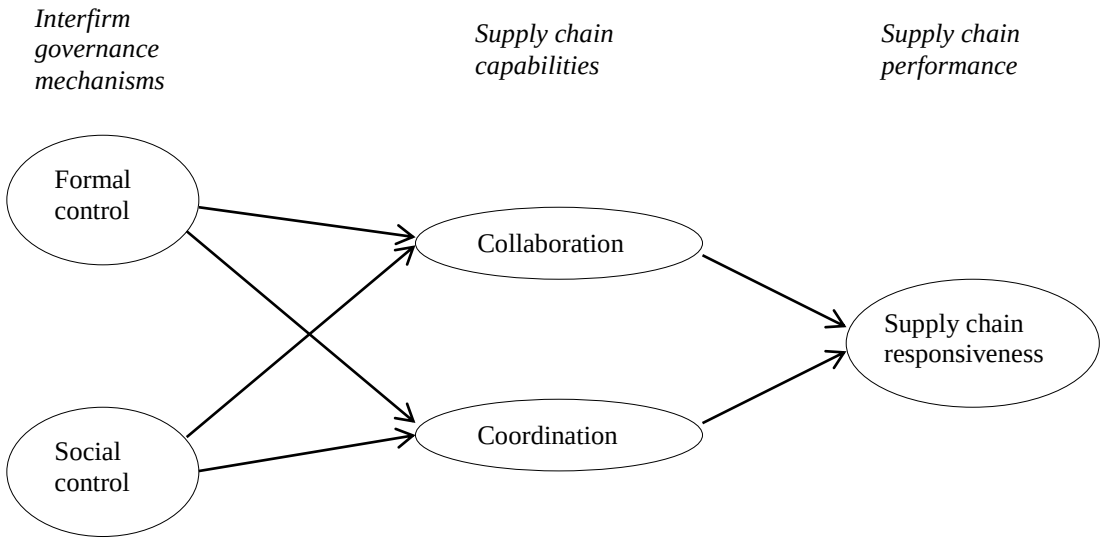
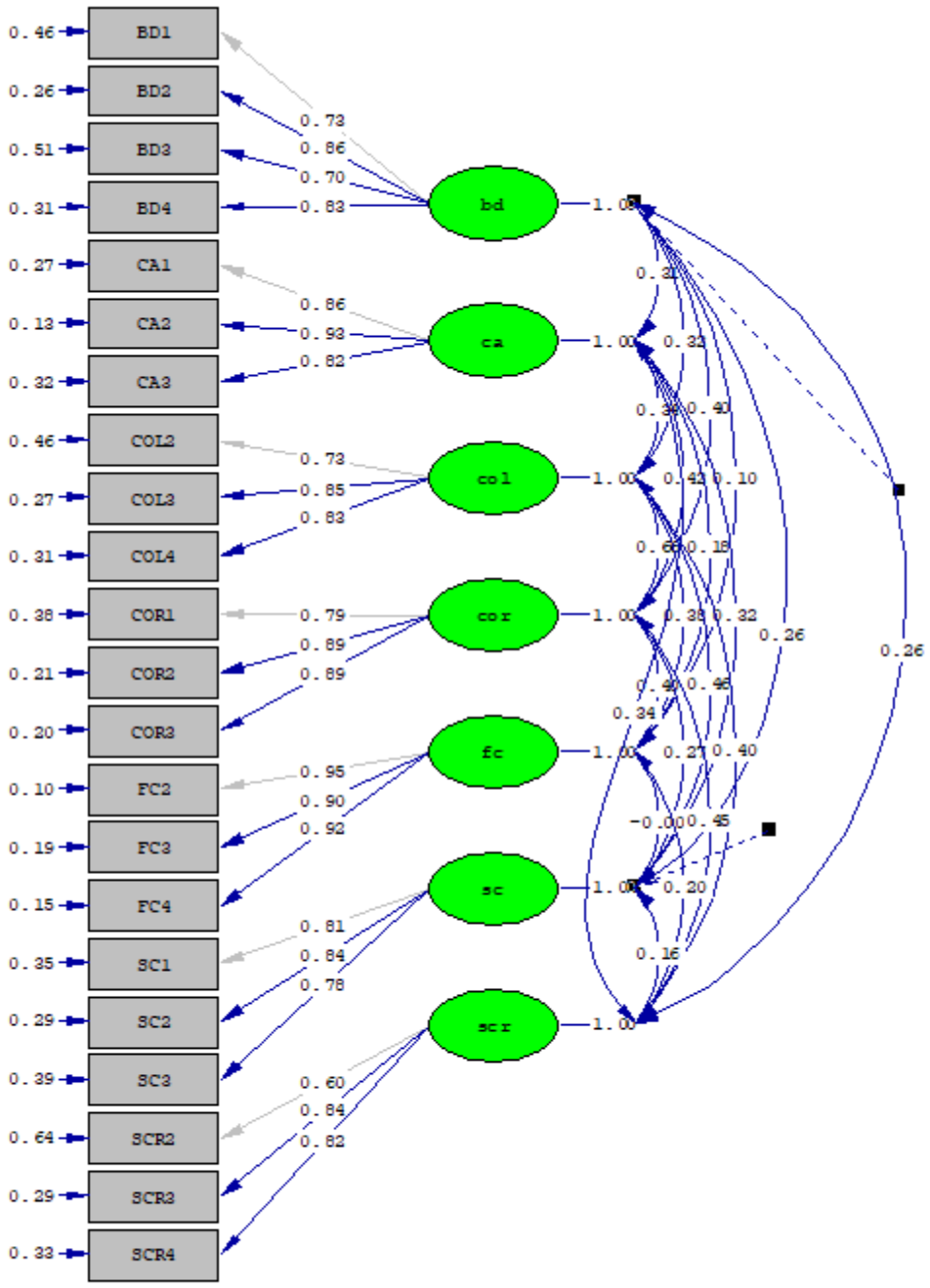


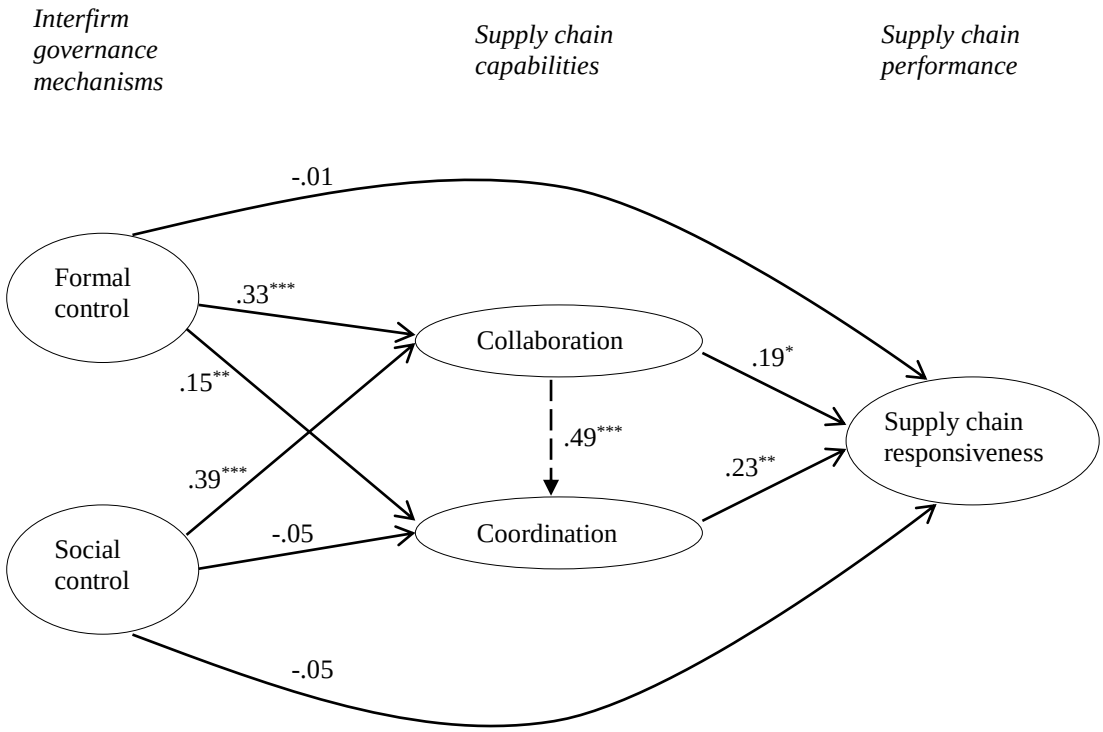
Figure 1. Conceptual model



Chi-Square=416.11, df=188, P-value=0.00000, RMSEA=0.061

Notes: *bd* = buyer dependence; *ca* = channel advantage; *col* = collaboration; *cor* = coordination; *fc* = formal control; *sc* = social control; *scr* = supply chain responsiveness.

Figure 2. Measurement results



Note:

1. *p< .05; ***p < .01; ***p < .001.
2. Model fit indices: $\chi^2 = 434.28$, df = 203, $\chi^2/df = 2.139$, RMSEA = .059, NNFI = .939, CFI = .951, SRMR = .048.
3. Covariates in models of supply chain capabilities and performance are buyer dependence, channel advantage, and relationship experience.
4. Broken line represents control path.

Figure 3. Empirical model