Leveraging supply chain orientation for global supplier responsiveness

The impact of institutional distance

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Abstract

Purpose – The purpose of this paper is to utilize middle-range theorizing to examine whether a US manufacturer can leverage supply chain orientation (SCO) to garner responsiveness from a global supplier. To capture the interplay of macro-level institutional environments, the authors examine the moderating effect of institutional distance on the SCO–supplier responsiveness relationship.

Design/methodology/approach – Primary survey data collected from US manufacturers are utilized to measure SCO and supplier responsiveness. Two secondary data sets (EIU and GLOBE) capture formal and informal distance at the institutional level and are used to test the moderating effect of institutional distance.

Findings – The research finds that SCO can facilitate global supplier responsiveness. A post hoc exploratory analysis reveals a three-way interaction, where the SCO–supplier responsiveness relationship is strengthened when formal and informal institutions are either very similar or very different.

Research limitations/implications – The research offers a more nuanced understanding of manufacturer–supplier relationships in global supply chains by demonstrating how country-level (macro) characteristics can influence firm-level (micro) supply chain phenomena. It extends research on SCO by illustrating how institutional distance interacts with a manufacturer’s ability to leverage SCO to enable supplier responsiveness.

Practical implications – Manufacturers should increase their attentiveness to institutional distance. When both formal and informal distances are different (i.e. high distance), SCO can create a powerful lever to improve global supplier responsiveness. Likewise, when formal and informal institutions are similar (i.e. low distance), SCO reinforces joint efforts and collaboration to create additive benefits, whereby suppliers are incentivized to be responsive to unexpected environmental changes.

Originality/value – This research addresses the growing call for more empirical studies that examine how country-level institutions influence firm-level phenomena. It also utilizes secondary data to serve as a proxy for formal and informal institutional distance.

Keywords North America, Survey, Europe, Asia, Buyer–supplier relationships, Supplier management, Global logistics

Paper type Research paper

1. Introduction

A firm’s supply chain can have a profound effect on its performance dimensions related to cost, quality and timeliness (Liao et al., 2010). Previous research highlights the need for firms to leverage supply chain relationships in order to be more responsive to changing conditions and increasing customer demands (Cao and Zhang, 2011; Davis-Sramek et al., 2007; Holweg, 2005). As such, a stream of research has focused on supply chain orientation (SCO), which is a multi-dimensional construct that captures a firm’s strategic awareness of the benefits created
Grounded in the relational exchange paradigm, this research examines how SCO can be leveraged to improve supplier responsiveness. While this is an important relationship to examine, the pervasiveness and significance of global supply chains point to an additional need to examine its nuances in a global context. Literature examining SCO offers very little insight into the added complexities that can exist when a manufacturer resides in one country and a supplier resides in another (Dong et al., 2016). Given the current state of the field and the reality of global supply chains, a significant contribution to the supply chain literature includes embracing a more macro-level institutional perspective that enhances understanding of SCO (Yang et al., 2012).

To frame the SCO–supplier responsiveness relationship in a global context, the research incorporates the impact of macro-level institutions into the theorizing. Institutional theory posits that a nation’s institutional environment creates durable social structures that shape a firm’s expectations and inform its limits for business operations (Scott, 2001). The implications of the theory are quite relevant to this research. When a manufacturer in one country establishes a relationship with a supplier in another country, institutional distance, or the difference between the two institutional environments, should be considered (Kostova, 1997). The amount or size of institutional distance stems from differences in both formal institutions (e.g. formalized laws, regulations and monitoring/enforcement approaches) and informal institutions (e.g. differences in informal norms, values and beliefs between countries) (Bae and Salomon, 2010; Xu and Shenkar, 2002). This is significant because greater distance between a manufacturer and its supplier may exacerbate the risk of longer lead times, difficult on-time delivery and increased concern about disruptions and security issues (Griffith and Myers, 2005).

Through middle-range theorizing (Stank et al., 2017), the purpose of this research is to examine whether a US manufacturer can leverage SCO to garner responsiveness from a global supplier. To capture the interplay of institutional environments, we examine the moderating effect of institutional distance on the SCO–supplier responsiveness relationship. (Busse et al., 2016; Peng, 2003) In short, we posit that when the two nations have very different institutional environments (i.e. distance is high), SCO becomes more significant for manufacturers that need responsive suppliers. The relevance of this research is pronounced as companies continue to stretch their upstream supply chains into the global landscape. More broadly, this research offers insight into how supply chain relationship phenomena can be influenced by country-level frameworks.

We test this theoretical framework on a sample of 320 US manufacturer–global supplier relationships by combining primary survey data on SCO and supplier responsiveness at the firm level with two secondary, separate data sets that capture formal and informal institutional distance at the country level. We cast the study at the relationship unit of analysis, whereby a US-based manufacturer provides insight about its relationship with a global supplier. The paper proceeds with a review of the literature and hypotheses development, followed by an explanation of the method and the results. Finally, we offer a discussion of the findings that outlines the implications and limitations of the research.

2. Theoretical framework and hypotheses development

Middle-range theorizing has been recently introduced in the logistics and supply chain literature as a means to integrate contextual richness and specificity into the field’s phenomena (Carter, 2011; Stank et al., 2017). Its aim is to combine knowledge from grand theories to provide “theoretical contextualization” which ensures rigorous theorizing that is closely tied to underlying industry contexts (Craighead et al., 2016). For this research,
insights from relational exchange theory provide rationale for the SCO–supplier responsiveness relationship. Further, institutional theory provides means to explain how institutional distance is integrated to develop a more precise boundary condition operating in the manufacturer–global supplier context.

2.1 SCO–supplier responsiveness relationship

The logistics and supply chain literature indicates that increasingly, manufacturing firms are developing cooperative, mutually beneficial relationships with suppliers (Tan et al., 2002). The characteristics of the relationships are reflected in relational exchange theories (Granovetter, 1985). The success of these relational exchanges have since become paramount in effective supply chain management, with demonstrated outcomes including increased responsiveness (Kaufmann and Stern, 1988), inventory reduction, increased quality and competitive advantage (Flynn et al., 1995) and improved cooperative behavior and financial results (Cannon et al., 2000).

Theoretical insights from relational exchange along with a visible shift in supply chain practice have led to a stream of research that seeks to examine and explain SCO. SCO reflects an intra-organizational management philosophy that includes a shared belief system about how to manage suppliers, as well as behavioral norms that facilitate relational exchange (Esper and Defee, 2010). In other words, a firm’s SCO involves its predisposition to build and maintain collaborative supply chain relationships (Mentzer et al., 2001; Min and Mentzer, 2004). It captures characteristics that are necessary for relational exchange between a manufacturer and a global supplier (Min et al., 2007; Defee and Fugate, 2010; Esper and Defee, 2010). Second-order reflective dimensions of SCO include trust (Ganesan, 1994), commitment (Morgan and Hunt, 1994), organizational compatibility (Bucklin and Sengupta, 1993), cooperative norms (Cannon and Perreault, 1999) and top management support (Min et al., 2007).

While research demonstrates that firms with SCO can successfully implement supply chain management strategies (e.g. Kirchoff et al., 2016; Min et al., 2007; Schulze-Ehlers et al., 2014; Sluis and Giovanni, 2016), little is known about the direct benefits of a firm’s SCO in global supplier relationships. SCO is normally operationalized at the firm level, but it is widely understood that firms align their supply base to manage a portfolio of relationships based on strategic intent, environmental considerations and relationship characteristics (Terpend et al., 2011). Therefore, we offer more precision by applying SCO to one distinct relationship with a manufacturing firm’s major global supplier.

As illustrated in Figure 1, we contend that SCO will have a positive impact on supplier responsiveness, which reflects the extent to which a supplier can quickly respond to

Figure 1. Theoretical model
Supplier responsiveness has been linked to better operational performance, market performance and improved customer satisfaction (Handfield and Bechtel, 2002). However, clarity about the mechanisms that develop a responsive supply base is lacking (Lawson et al., 2009; Sinkovics et al., 2011). Previous studies suggest that relational requirements for improved responsiveness are the development of trust, improved communication and a close relationship between firms and their suppliers (Choi and Krause, 2006; Handfield and Bechtel, 2002). We posit that when a manufacturer displays SCO behaviors that reinforce a strong relationship with its global supplier, then supplier responsiveness will be enhanced (Zhou et al., 2008):

**H1.** A manufacturing firm’s SCO associates positively to the supplier’s responsiveness.

### 2.2 Interaction effects of institutional distance

Like the majority of supply chain research, H1 is situated at the micro level of analysis (Signori et al., 2015). Traditional theories in supply chain research have been criticized for assuming macro-level institutional frameworks away as “background conditions” (Peng et al., 2008). This is problematic because the institutional environment at least partially determines the firm’s behaviors (Rose et al., 2016). Institutional theory proposes that firm-level phenomena are often subject to the broader macro country-level institutional environment, which includes formal and informal influences. The core premise of institutional theory is that a firm operates within a national environment where normative rules, heuristics and values are outside of its direct control.

When a manufacturer and a supplier operate within the same institutional environment (i.e. both in the same country), they are influenced by similar structures, rules and values (Kostova and Roth, 2002). Joint efforts and collaboration are supported because both have a common understanding and point of reference in which to operate and make decisions. Benefits include access to complementary or scarce resources, operational expertise, increased learning capabilities and access to global markets (Abdi and Aulakh, 2012). Alternately, when a manufacturing firm establishes a relationship with a global supplier, it must operate within the supplier’s institutional environment while simultaneously being subjected to the one in its own country (Busse et al., 2016). In some cases, institutional environments can be profoundly different, and in other cases, the environments can be very similar. In order to capture the differences in institutional environments at the country level, institutional distance was introduced as a means to examine the extent of (dis)similarity between domestic and foreign institutions (Kostova, 1997).

Manufacturer–supplier relationships in institutionally distant environments can be challenging for three reasons. First, distance leads to potentially more governance difficulties due to confusion about partner responsibilities (Abdi and Aulakh, 2012; Dong et al., 2016). Second, interpretations about structure and situational responses across cultures vary, as do norms, behaviors and the general understanding about expectations in the relationships (Dyer and Nobeoka, 2000). Third, organizational practices and processes within the context of institutional norms and legal frameworks complicate the rules and enforcement of supply chain practices (Chan et al., 2008).
Institutional distance is most predominant in international business (e.g. Estrin et al., 2009; Schwens et al., 2011; Xu and Shenkar, 2002; Abdi and Aulakh, 2012) because it provides a roadmap for firms to adapt business strategies and operational activities to more effectively manage the (dis)similarities (Kogut and Singh, 1988; Kostova et al., 2008; Kostova and Zaheer, 1999). The concept of institutional distance is still in a nascent stage of development in the supply chain literature (e.g. Busse et al., 2016; Wilhelm et al., 2016; Dong et al., 2016). Therefore, this research follows the dominant conceptualization of institutional distance in the international business literature that focuses on two overarching dimensions (e.g. Aleksynska and Havrylchyk, 2013; Gaur and Lu, 2007; Schwens et al., 2011; Abdi and Aulakh, 2012). Formal institutional distance comes as a result of the differences in market support institutions between countries (Schwens et al., 2011; Meyer et al., 2009). Informal institutional distance results from differences between the home and host country in terms of national culture and ideology (Estrin et al., 2009; Schwens et al., 2011).

2.2.1 Formal institutional distance. Formal institutions are manifested in political rules, legal decisions and economic issues; they dictate private property rights, access to finance, the development of skills and knowledge and labor relations (Peng, 2003). In countries like the USA, they provide predictable expectations, support for efficiency and low risk of corrupt business practices (North, 1990). Their role is essential in the effective functioning of market mechanisms because they allow firms to engage in business transactions without incurring undue costs or risks (Meyer et al., 2009).

If a US manufacturer has a global supplier in a country where institutions impose restrictions and constraints that increase risk and uncertainty, formal distance can be quite high and become a valid concern (Peng, 2003). High levels of distance in formal institutions can create relationship difficulties in several ways. First, it can create variation in legal frameworks that outlines obligations and enforces contracts that manufacturers establish with global suppliers (Abdi and Aulakh, 2012). Distance can also create substantial variation in how the rules of exchange are established and regulated by a body of law or contractual specifications. Finally, distance leads to differences in judicial systems that make it difficult to enforce agreements or contracts (Delios and Henisz, 2003). In some extreme cases, institutional differences due to corruption and favoritism can make it extraordinarily challenging to do business with a global supplier (Henisz and Williamson, 1999). In short, as distance increases, a manufacturer is challenged to adapt the terms of the supplier relationship to accommodate those differences in political, legal or economic institutions (Schwens et al., 2011).

One proposed remedy to mitigate the effect of formal distance is using contracts, but more recent research finds that this is not an effective mechanism (Abdi and Aulakh, 2012). This research posits that the relational ties that are created through SCO improve supplier responsiveness, even more so when formal institutional distance is high. SCO provides a foundation for a global supplier to meet obligations and expectations that can compensate for differences in legal frameworks or enforcement mechanisms emanating from formal institutions. In short, SCO becomes even more critical in manufacturer–supplier relationships when supplier responsiveness is a key outcome and distance in formal institutions is prevalent (Zhou et al., 2008). Therefore, the following is hypothesized:

H2. When formal distance between a US manufacturer and a global supplier is high, the relationship between SCO and supplier responsiveness is strengthened.

2.2.2 Interaction effect of informal institutional distance. Distance from informal institutions is a function of differences in embedded social processes that are not formally codified, but reflected in the shared norms, values and beliefs of a society (North, 1990). Because informal institutions are more tacit and engrafted in country structure (Gersick, 1991), they are
persistent, even with legislative changes in formal institutions (Estrin et al., 2009). Collective behaviors and knowledge form a basis for norms and values that becomes unquestioned within a country (Hoffman, 1999). In the international business literature, informal institutions reflect strong and deep-seated norms, long-lasting values and priorities underscored in national culture (Hofstede, 1991; House et al., 2004). Informal distance results from differences in values, beliefs, customs, traditions and codes of conduct between the manufacturer’s home country and that of the global supplier (Salomon and Wu, 2012).

US manufacturers are affected by informal institutions in a supplier’s country because of the imprints made in historical management practices and administrative heritage (Kogut and Zander, 1993). Distance creates barriers that make operations between the manufacturer and supplier more difficult (Park and Ungson, 1997; Sirmon and Lane, 2004), and it hampers the ability to accomplish joint goals (Whipple and Frankel, 2000). Further, informal distance creates gaps in language and business practices, escalates communication issues, and makes implementing agreements more difficult (Estrin et al., 2009). Supply chain operations are affected in particular because each firm is compelled to operate based on their own cultural orientation, and distance creates governance difficulties (Griffith and Myers, 2005).

Research demonstrates that challenges stemming from informal distance can be addressed most effectively by experiential learning, close interaction and relational governance mechanisms (Yang et al., 2012; Salomon and Wu, 2012). Consistent with H2, this research posits that SCO improves supplier responsiveness even more so when informal institutional distance is high. As informal distance increases, firms are likely to increase their attentiveness to the cultural differences, compelling supply chain personnel to be more cognizant of possible misinterpretations that come as a result (Sirmon and Lane, 2004). More relational effort is required, as well as increased time devoted to dealing with the possibility of conflict or misunderstanding. In short, SCO becomes more critical in manufacturer–supplier relationships when supplier responsiveness is a key outcome and distance in informal institutions is prevalent. Therefore, the following is hypothesized:

H3. When informal distance between a US manufacturer and a global supplier is high, the relationship between SCO and supplier responsiveness is strengthened.

3. Method
3.1 Sample
The first step in the data collection process was a scale pre-test. InfoUSA (a data services company) provided a list of 1,000 potential informants employed by US manufacturing firms. Through telephone interviews, 425 qualified respondents were identified to participate in a web-based survey. Of these, 103 (or 24 percent) actually participated, and confidentiality of their responses was assured. These responses were used to enhance readability and to demonstrate validity and reliability. InfoUSA then provided another listing of 5,000 different potential respondents. Telephone interviews were again used to ensure that the potential respondent was a mid- to top-level logistics, purchasing or supply chain manager, that the firm sourced globally, and that they possessed sufficient knowledge of the organization’s global suppliers. This led to 1,452 qualified potential respondents. After follow-up phone calls were made to increase the participation rate, 320 respondents participated in the survey (a 22 percent response rate).

Of the 320 respondents, 60 percent held job levels of director or higher, with the remaining being middle-level managers. On average, corresponding supplier relationships with the manufacturer was six years. Less than 1 percent reported annual sales of under $1m, and 11 percent had sales over $500m. Respondents worked for an array of manufacturing firms: the most common was computers/electronics (11.9 percent), followed
by wood products (9.7 percent), chemicals (8.8 percent), machinery (8.4 percent), textiles (8.1 percent) and paper (8.1 percent), with the remainder spread across six other industrial manufacturing areas. The 320 global supplier relationships spanned 33 countries (Table I provides the distribution).

As part of the screening process via the initial phone calls, qualified respondents who declined to take the online survey were asked if they would provide verbal answers to five survey items to assess non-response bias. Of those who declined, 110 provided verbal answers to five non-demographic items. Testing for differences against the full survey data responses (Mentzer and Flint, 1997), no significant differences \( (p \leq 0.05) \) were found, so non-response bias is not a concern.

### 3.2 Measures

Developing measurement scales for the SCO and supplier responsiveness constructs proceeded through a series of steps. A literature search for available measures led us to the original SCO scale offered by Min et al. (2007). Consistent with this seminal study and detailed in Table II, we operationalized SCO as a multi-dimensional second-order construct, with dimensions to include trust, commitment, organizational compatibility, cooperative norms and top management support. Supplier responsiveness measures were adapted from previous literature as well (Omar et al., 2012; Swafford et al., 2006), and measures are detailed in Table III. The unit of analysis was the relationship, i.e., the manufacturers’ perception of their SCO and their perception of a single global supplier’s responsiveness. We adapted the scales to reflect the distinct relationship between a US-based manufacturer and a global supplier. We assessed size as a control variable.

To test institutional distance at the country level between the USA and the country of the manufacturer’s global supplier, the research utilized two secondary data sets. Data for formal distance were provided by the Economist Intelligence Unit (EIU) (Hoti and McAleer, 2004). Formal institutional distance refers to the cross-country differences of the USA and the supplier country regarding the legal, political or economic systems. Various country risk rating reports have been found to be valid proxies for examining the formal institutional environment of a country (Aleksynska and Havrylchyk, 2013; Gaur and Lu, 2007; Schwens et al., 2011; Wilhelm et al., 2016). We utilized the EIU panel data to assess the difference in-country risk.

<table>
<thead>
<tr>
<th>Country of supplier</th>
<th>Number of times country was listed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia, Austria, Portugal, Ecuador, Bolivia, Indonesia, Ireland, Kazakhstan, Poland, Russia, Greece</td>
<td>1</td>
</tr>
<tr>
<td>Denmark, Finland, Israel, The Netherlands, Venezuela</td>
<td>2</td>
</tr>
<tr>
<td>Malaysia, Thailand</td>
<td>3</td>
</tr>
<tr>
<td>Spain, Sweden</td>
<td>4</td>
</tr>
<tr>
<td>Switzerland</td>
<td>5</td>
</tr>
<tr>
<td>Brazil, South Korea</td>
<td>6</td>
</tr>
<tr>
<td>France</td>
<td>7</td>
</tr>
<tr>
<td>Italy</td>
<td>10</td>
</tr>
<tr>
<td>India</td>
<td>11</td>
</tr>
<tr>
<td>UK</td>
<td>12</td>
</tr>
<tr>
<td>Taiwan</td>
<td>15</td>
</tr>
<tr>
<td>Mexico</td>
<td>22</td>
</tr>
<tr>
<td>Japan</td>
<td>23</td>
</tr>
<tr>
<td>Germany</td>
<td>25</td>
</tr>
<tr>
<td>Canada</td>
<td>41</td>
</tr>
<tr>
<td>China</td>
<td>102</td>
</tr>
<tr>
<td>Total</td>
<td>320</td>
</tr>
</tbody>
</table>

Table I. Home country of global suppliers
between the two countries. Specifically, we used the indicator “operational risk” that provides ratings for 180 countries on a scale of 0–100. This indicator in the EIU data set was deemed an acceptable proxy for formal distance. In total, 66 underlying measures capture security, political stability, government effectiveness, the legal and regulatory environment,
foreign trade, tax and labor policies, financial and macroeconomic risks and infrastructure. The scores for each country reflect the strengths or the deficiencies in the formal institutional environment. Based on these data, we constructed the institutional distance variable as the absolute distance between the US score and the score of the supplier country (Aleksynska and Havrylchyk, 2013).

Informal institutional distance refers to the degree to which socially sanctioned codes of conduct and norms of behavior embedded in culture and ideology in the supplier country differ than those from the USA (Peng, 2003). It was measured by incorporating the GLOBE study data, which measures nine dimensions of societal culture across 62 countries (Estrin et al., 2009; House et al., 2004; Schwens et al., 2011). Because informal distance represents the differences in informal institutions between the USA and the country of the US manufacturer’s global supplier, we followed Kogut and Singh’s (1988) method[1]. Specifically, we incorporated the GLOBE indices to form a composite index for distance based upon the deviation along each of the cultural dimensions between the two nations.

3.3 Measurement model analysis
Prior to conducting a confirmatory factor analysis (CFA), we separately assessed the unidimensionality of the SCO and supplier responsiveness items using principle components analysis. In both cases, only the first eigenvalue was greater than one, and visual inspection of the scree slope revealed that use of a single factor was appropriate. The framework was then taken into CFA. The CFA fit, based only on multi-item scales, was acceptable: $\chi^2 = 92.393; \text{df} = 37; p < 0.01; \text{RMSEA} = 0.069; \text{NNFI} = 0.935; \text{CFI} = 0.956$. Convergent validity was assessed by examining the magnitude, direction and statistical significance of the estimated standardized factor loadings. As illustrated in Table IV, they were all significant and positive. While the loadings are significant, several of the loadings for the SCO latent variable just meet the minimum threshold of 0.45. The scale composite (or congeneric) reliability ($\rho_c$) of both multi-item constructs exceeds 0.70. The average variance extracted for the SCO latent variable is somewhat low (AVE = 0.385), while that of the global supplier responsiveness latent variable is acceptable. Mean shared variance was assessed and estimates below 0.110 were observed for all latent variables. The low values are consistent with very low common method variance. Common method variance is systematic bias attributable to process identically across items, which is of little concern because no common method exists across formal distance, informal distance and the sample survey variables. Finally, discriminate validity was examined through $\Delta \chi^2$ ($\Delta \text{df} = 1$) tests by comparing the baseline CFA model to models with the non-causal correlation between pairs of latent variables fixed to unity. Evaluating one pair of factors at a time, we found that each alternate model did not demonstrate better fit, supporting discriminate validity. Table IV provides the correlation matrix of the variables in the analysis and variable summary statistics.

<table>
<thead>
<tr>
<th>Variable</th>
<th>SCO</th>
<th>FID</th>
<th>IID</th>
<th>Size</th>
<th>Mean</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.699</td>
<td>1.027</td>
<td>1.67</td>
<td>7.00</td>
</tr>
<tr>
<td>Formal institutional distance (FIID)</td>
<td>$-0.229^{**}$</td>
<td></td>
<td></td>
<td></td>
<td>34.106</td>
<td>13.745</td>
<td>0.00</td>
<td>75.00</td>
</tr>
<tr>
<td>Informal institutional distance (FIID)</td>
<td>$-0.125^{**}$</td>
<td>0.391*</td>
<td></td>
<td></td>
<td>1.294</td>
<td>0.619</td>
<td>0.12</td>
<td>3.91</td>
</tr>
<tr>
<td>Size</td>
<td>$-0.114^{**}$</td>
<td>0.011</td>
<td>0.025</td>
<td></td>
<td>2.650</td>
<td>0.847</td>
<td>1.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Flexibility</td>
<td>0.431*</td>
<td>$-0.281^{*}$</td>
<td>$-0.106$</td>
<td>$-0.105$</td>
<td>3.963</td>
<td>1.171</td>
<td>1.00</td>
<td>7.00</td>
</tr>
</tbody>
</table>

Notes: *$p < 0.01$; **$p < 0.05$

Table IV. Correlation matrix and summary statistics
4. Results

Table V summarizes hierarchical regression model results. In Model I \((F = 22.585, p < 0.01)\), supplier responsiveness is modeled as a function of four main effects: one hypothesized effect concerning SCO and four control effects concerning formal institutional distance, informal institutional distance and size. Model II \((F = 12.977, p < 0.01; R^2 = 0.225)\) includes three two-way interaction effects: SCO × formal institutional distance; SCO × informal institutional distance; and formal institutional distance × informal institutional distance. Mean centering was undertaken prior to creating the interaction terms. The ΔR^2 test between Models I and II reveals that the addition of the two-way interactions adds no explanatory power \((F of ΔR^2 = 0.351; p > 0.05)\).

H1 stated that SCO and supplier responsiveness associate positively. H1 is supported \((β = 0.399; t = 7.686, p < 0.01)\). H2 and H3, not supported, respectively, stated that the interaction of SCO with formal institutional distance \((β = 0.001; t = 0.919)\) and with informal institutional distance \((β = −0.053; t = −0.951)\), would be positive. One control effect is significant: formal institutional distance inversely predicts supplier responsiveness \((β = −0.197; t = −3.564; p < 0.01)\).

The error term in these three models is uncorrelated with the explanatory variables. Furthermore, the likelihood of simultaneity between the dependent variable, supplier responsiveness and the independent variables is extremely low, e.g., theoretical support is remote for the notion that supplier responsiveness results in formal and/or informal institutional distance at the national level. Aside from omitted variable bias, discussed later, the level of concern for endogeneity is low.

4.1 Exploratory post hoc testing

Because the two-way interaction effects hypothesized in H2 and H3 were not supported, we were compelled to understand if there was further explanation for their lack of significance. As such, we examined a more exploratory post hoc model containing the three-way interaction among SCO, formal institutional distance and informal institutional distance (Model III in Table V). The addition of the three-way interaction adds explanatory power to the model \((F of ΔR^2 = 4.134, p < 0.05)\). Model III is significant \((F = 11.987, p < 0.01)\) and explains 23.6 percent of the variance in supplier responsiveness. Substantive model results remain unchanged across Models II and III, i.e., only H1 is supported and the same control

![Table V. Summary of regression model results](image-url)

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Model I</th>
<th>Standardized estimate (t-value)</th>
<th>Model II</th>
<th>Model III (post hoc)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCO (H1)</td>
<td>0.393 (7.652*)</td>
<td>0.399 (7.686*)</td>
<td>0.361 (6.578*)</td>
<td></td>
</tr>
<tr>
<td>Formal institutional distance (FID)</td>
<td>-0.198 (-3.593*)</td>
<td>-0.197 (-3.564*)</td>
<td>-0.200 (-3.633*)</td>
<td></td>
</tr>
<tr>
<td>Informal institutional distance (IID)</td>
<td>0.019 (0.357)</td>
<td>0.027 (0.491)</td>
<td>0.049 (-0.873)</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>0.047 (0.935)</td>
<td>0.043 (0.863)</td>
<td>0.043 (0.873)</td>
<td></td>
</tr>
<tr>
<td><strong>Two-way interactions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCO × FID (H2)</td>
<td>0.001 (0.919)</td>
<td>0.016 (-0.300)</td>
<td>-0.001 (-0.300)</td>
<td></td>
</tr>
<tr>
<td>SCO × IID (H3)</td>
<td>-0.053 (-0.951)</td>
<td>0.028 (-0.480)</td>
<td>0.028 (-0.480)</td>
<td></td>
</tr>
<tr>
<td>FID × IID</td>
<td>-0.025 (-0.477)</td>
<td>0.045 (-0.853)</td>
<td>0.045 (-0.853)</td>
<td></td>
</tr>
<tr>
<td><strong>Post hoc exploratory three-way interaction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCO × FID × IID</td>
<td>0.118 (2.035**)</td>
<td>0.118 (2.035**)</td>
<td>0.118 (2.035**)</td>
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effect is significant. The three-way interaction effect is significant with a positive estimate ($\beta = 0.118$, $t = 2.035$, $p < 0.05$). The complexity of a three-way interaction is shown in the Figure 2 plot. This three-way interaction therefore provides a more nuanced understanding of the complex nature of manufacturer–global supplier relationships that the two-way interactions hypothesized in $H2$ and $H3$ did not explain. A more detailed explanation of these post hoc results is presented in the subsequent discussion.

5. Discussion

The overarching contribution of this research to the field is to offer more nuanced and grounded understanding of manufacturer–supplier relationships in global supply chains. It is important to demonstrate how country-level (macro) characteristics can influence firm-level (micro) supply chain phenomena. The more specific purpose of the research was to examine whether US manufacturers gain additional leverage from SCO when they need responsiveness from global suppliers that have very different country-level institutions. As such, this study offers several extensions to past studies: inclusion of supplier responsiveness as a key outcome of SCO, utilization of two secondary data sets to incorporate and measure institutional distance, and integration of institutional theory into a supply chain relationship model.

To enhance the nuances of the global context, the nature of this research took a middle-range theorizing approach (Stank et al., 2017; Craighead et al., 2016). Stank et al. (2017) purported three requirements of middle-range theorizing: clear positioning within a specified domain of knowledge, a direct extension of established findings and explicit focus on context and causal mechanisms. We demonstrate these elements by taking a pluralistic approach to integrate the “grand theories” of relational exchange and institutional theory within the SCO domain of knowledge. We extend previous findings by examining the impact of institutional distance, and we test our theorizing in a US–global supplier relationship context. Consistent with calls from Goldsby et al. (2013) and Fawcett and Waller (2011) to increase the precision of the field’s theorizing, we examine the contextual mechanisms and their boundary conditions by capturing macro-level contingencies via institutional distance that interact with a US manufacturer and global supplier relationship. We outline the specific contributions of the research below.

Reflective of literature grounded in relational exchange theories, the SCO stream of research specifically highlights the benefits and performance outcomes from collaborative relationships (e.g. Kirchoff et al., 2016; Min et al., 2007; Schulze-Ehlers et al., 2014; Sluis and

Figure 2.
Three-way interaction effect

SCO for global supplier responsiveness
Giovanni, 2016). The research adds to this stream of literature by highlighting the value that SCO can bring when it is directed to a manufacturer’s supply base (Liao et al., 2010). This is especially true with global suppliers, and this study supports SCO as a means to achieve responsiveness from a global supplier. We further build on SCO research by narrowing it to a specific relationship. We underscore how a manufacturer’s relationship with a supplier can encourage the supplier to be responsive to changes outside of the control of either firm.

By incorporating institutional theory, we illustrate that macro-level forces can shape relationships with global suppliers (Kouvelis et al., 2006). More specifically, we highlight the relevance of institutional distance in manufacturer–supplier relationships that cross national boundaries. By using the EIU data to reflect the legal, political or economic systems of the USA and supplier countries, a more holistic picture of formal institutions was provided. Likewise, the GLOBE data that capture dimensions of societal culture in the USA and the supplier countries offers a telling picture of informal institutions. This secondary data allowed us to measure the (dis)similarity between the USA and other countries represented in the study. Both data sets offer the field a robust proxy for assessing institutional distance. They offer a greater degree of managerial relevance because companies often rely on these types of country rating systems in their decision-making processes (Schwens et al., 2011). Use of the same proxy across studies aids in the development of future knowledge and the maturation of the discipline. Future research should also incorporate data that can bolster theoretical predictions and enhance the robustness of the results.

We hypothesized that when formal and informal institutions between a manufacturer and global supplier were more dissimilar (i.e. greater distance), SCO would be more significant in a manufacturer’s ability to enable supplier responsiveness. At first blush it appeared that SCO is not any more effective when there is a high degree of institutional distance (see Table V, Model II). To understand the lack of support for \( H_2 \) and \( H_3 \), a post hoc analysis shed more light on the complex interplay between institutional distance and the SCO–supplier responsiveness relationship. The results of the post hoc analysis are captured in Table V, Model III and Figure 2. As the plot illustrates, when US manufacturers have global suppliers with very different institutional environments on both dimensions of distance (i.e. high formal distance and high informal distance), then SCO has a more pronounced effect on supplier responsiveness. Likewise, Figure 2 illustrates that when US manufacturers have global suppliers with very similar institutional environments on both dimensions of distance (i.e. low formal distance and low informal distance), then SCO also has a more pronounced effect on supplier responsiveness. In other words, SCO is more effective in facilitating supplier responsiveness when formal and informal institutions are both very similar or both very different.

While future research will need to parse out the nuances of this three-way interaction, previous research provides some limited insight. Manufacturers will enter into sourcing arrangements more cautiously and deliberately when confronted with high levels of institutional distance (Park and Ungson, 1997). It may be that significant distance in both formal and informal distance becomes more obvious and makes managers more acutely aware of the differences. This awareness would justify the need to develop partner-level collaboration found in SCO. Likewise, when both formal and informal institutional environments are very similar, shared frames of reference and cognitive frameworks already create a mutual understanding that prompts similar processes and defines norms (Xu and Shenkar, 2002). When there are fewer institutional differences to overcome, SCO creates additive benefits by reinforcing joint efforts and collaboration in the relationship that incentivizes supplier responsiveness.

There is additional opportunity to utilize institutional distance in supply chain research. A recent literature review by Kauppi (2013) reveals that institutional theory has emerged as an important lens to use in supply chain research, but only a handful of recent studies have
applied the concept of institutional distance (Busse et al., 2016; Dong et al., 2016; Wilhelm et al., 2016). Although a firm is most familiar with its domestic institutional environment, supply chain management has become increasingly more global because the “home” institutional environment may not be the most favorable for all kinds of activities along the value chain (Gaur and Lu, 2007). Because of the institutional context that firms face outside of their own environment, it is imperative that scholars advance understanding about how to operate successfully in countries that may have similar or dissimilar institutional environments.

5.1 Managerial implications
This study reveals important implications for US manufacturing firms that have global supply bases. There are times that unanticipated events occur in a supplier’s country that are sometimes out of the supplier’s control. Nonetheless, manufacturing firms who need responsive supply chains count on suppliers to meet their delivery and fulfillment timelines. Manufacturers should know that SCO creates a strong incentive for suppliers to meet those obligations. When unanticipated factors can potentially create problems, suppliers are most responsive to partnerships that have relationship mechanisms such as trust and cooperative norms in place.

Manufacturers that understand the institutional distance inherent in their relationships allows them to further leverage SCO, depending on the (dis)similarities of the formal (e.g. political, legal and economic systems) and informal (e.g. societal norms, values and beliefs) country-level institutional environments within each supplier relationship. When the manufacturer has a global supplier that has very similar or very different formal and informal institutions (i.e. very little distance or very big distance), then the manufacturer can count on SCO to have an additive effect. In other words, manufacturers can get more gains from SCO in either one of those situations.

It should be further noted that supplier relationships are time and resource-intensive, so establishing SCO with a non-strategic supplier may not be worth the investment (Davis-Sramek et al., 2007). If a US manufacturer has sourcing flexibility or maintains enough safety stock that supplier responsiveness is not a key performance outcome within a specific supplier relationship, then the effort and resources involved in achieving SCO could be better placed elsewhere. Manufacturers should weigh the benefits that come from supplier responsiveness with the associated relational costs required to create that advantage.

5.2 Limitations
Given the various forms of bias in empirical research, several limitations should be noted that reflect the possibility of bias. First, there is potential for single rater bias (Roh et al., 2013) because we examined global supplier relationships from the perspective of one executive in each manufacturing firm. We had mechanisms in place to ensure that the respondents had adequate knowledge of relationships with global suppliers, but a more rigorous study for future research involves capturing both sides of the dyad. Second, there is the possibility of omitted variable bias. We modeled size as a control variable, which is arguably the most critical of all control variables (Kimberly, 1976), and Model III $R^2$ of 0.236 is of sufficient magnitude. It is unlikely that the inclusion of other control variables would influence the significance of the complicated three-way interaction effect. That said, omitted variable bias could be further attenuated in future research by controlling for industry effects or other relevant variables. Finally, common method bias is also a concern associated with survey research. We are least concerned by this, however, because combining secondary data enhances confidence in the study’s results (Craighead et al., 2011) and this bias is attenuated by the three-way interaction effect (Goldsby et al., 2013).

It should also be noted that this research does not fully adopt the critical realist perspective. To boost confidence in the results, triangulating the findings that test the SCO for global supplier responsiveness

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hypotheses using experimental and quasi-experimental methods would be desirable because stronger claims of causality could be made. This research could be extended to managerial decision-making scenarios or situational awareness situations that capture other factors that may be significant when companies form relationships with global suppliers. Further, performance effects in global supply chains may have non-linear or u-shaped relationships, which would also be an avenue for future research. While identifying the three-way interaction effect offers a nuanced understanding, we did not fully capture the true complexity of global supplier relationships in this study. Finally, we note that while there are benefits to utilizing secondary data, the use of proxies can pose issues for the validity of measurement as they can lack a clear one-to-one correspondence with theoretical concepts (Ketokivi and Schroeder, 2004). It would be beneficial for future research to develop multi-item scales to triangulate the findings.

Note
1. We followed Kogut and Singh (1988) and used GLOBE’s indices to form a composite index for CD based upon the deviation along each of cultural dimensions between the two countries. 

$$CD_{bs} = \sum_{i=1}^{4} \left( \frac{(I_{ib} - I_{is})^2}{V_i} \right) I_i$$

where $I_i$ stands for the index for the $i$th cultural dimension, and $b$ indicates the buyer country, $V_i$ is the variance of the index of the $i$th dimension, $s$ indicates the supplier country, and $CD_{bs}$ the cultural distance between the buyer country and the supplier country.

References


Further reading

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