



An Examination of the Relationship between Intellectual Capital and Supply Chain Integration in Humanitarian Aid Organizations: A Survey-Based Investigation of Food Banks

Cigdem Ataseven 

Department of Operations and Supply Chain Management, Monte Ahuja College of Business, Cleveland State University, 1860 East 18th Street, Cleveland, OH 44114, e-mail: c.ataseven@csuohio.edu

Anand Nair[†] 

Department of Supply Chain Management, Broad College of Business, Michigan State University, East Lansing, MI 48824, e-mail: nair@broad.msu.edu

Mark Ferguson 

Management Science Department, Darla Moore School of Business, University of South Carolina, Columbia, SC 29208, e-mail: mark.ferguson@moore.sc.edu

ABSTRACT

Food banks are humanitarian aid organizations that collect, organize, and deliver food to nonprofit member agencies and also to individuals to help alleviate the society's hunger problem. The supply chain of food banks is characterized by private sector companies, individual donors and governmental agencies providing monetary support and food inventory on the supply side, and the member agencies such as food pantries, soup kitchens, shelters, and volunteers delivering support on the demand side. Within the purview of this supply chain, food banks strive to improve their performance, which is commonly measured in terms of the amount of food delivered to the communities in need. Food banks rely on managerial talent that is relatively more constrained than private sector and also use voluntary workforce for attaining their performance goals. Considering the unique yet pertinent role of human assets in food banks to manage their supply chain integration initiatives, we employ an intellectual capital framework to analyze the human, organizational, and social capital antecedents of supply chain integration in food banks. Specifically, we suggest that intellectual capital drives supply chain integration in humanitarian organizations. Moreover, we propose specific relationships between the dimensions of intellectual capital. A carefully crafted survey is used to inform our results. The results indicate that human capital significantly impacts social capital, which, in turn, drives all supply chain integration dimensions. We discuss

[†]Corresponding author.

the implications of our findings for managing intellectual capital in the not-for-profit sector and offer directions for future research. [Submitted: January 23, 2017. Revised: September 25, 2017. Accepted: October 8, 2017.]

Subject Areas: Food Banks, Humanitarian Aid, Intellectual Capital, Supply Chain Integration, and Survey Research.

INTRODUCTION

Food banks act as centers for the redistribution of donated and surplus food that would otherwise be wasted. Over the past few decades, the food banking industry has played an important role in mitigating poverty, hunger, and wasted food problems by being the linchpin that matches the supply of excess food with the demand of food-challenged populations. Improving operations in food banks has the potential to impact several stakeholders in the network, including companies that are willing to donate food and care for sustainability issues, the communities in need, and the policy makers that are searching for better ways to increase the welfare of their constituents.

The origins of food bank idea go back to a basic endeavor to help the hungry people in particular neighborhoods around the end of 1960s. Some of the food bank organizations originally were set up as coalitions rather than as formal business models. For instance, Yolo County Coalition Against Hunger, which is the predecessor of Food Bank of Yolo County, came together with “the idea that the real force behind any coalition is the idea of cooperation” (Walters, 2010, p. 3). The supply chain for food banks is characterized by private sector companies, individual donors and governmental agencies providing monetary support and food inventory on the supply side, and the member agencies such as food pantries, soup kitchens, shelters, and volunteers delivering support on the demand side. Thus, supply chain networks are typically more complex than those of for-profit food distributors who often serve as middlemen between food manufacturers and food retailers. Moreover, unlike commercial supply chains, humanitarian supply chains are supply-driven, where customers have very little power (Tomasini & Van Wassenhove, 2009; p. 6). On the supply side, food banks coordinate “food, friends and funds” to make delivery to people in need. In these less formal networks, there is often no standardization in terms of expiration dates as well as quality and quantity of various donated items. Unlike most for-profit food chains, sorting was identified as a bottleneck operation during our case visits and observation of the daily operations in food banks. Additionally, there is an increase in the variability of the amount of donated money that adds to the complexity. Another factor is the volunteer base, which adds an extra source of uncertainty in the operations. While food banks have full-time and part-time employees, they also rely on volunteers to run their operations. On the demand side, there are beneficiaries who are in need of food that are served either directly from the food bank or via partner agencies such as soup kitchens, food pantries, shelters, etc. Overall, food banks, like many other humanitarian organizations, operate under tight constraints in complex networks and try to find ways to efficiently and effectively use their existing resources.

As nonprofits, food banks do not measure their success based on purely financial measures but instead focus on their performance in terms of the amount of food delivered to the communities in need. Another difference between commercial and humanitarian operations comes from resource constraints. Facility conditions (office, warehouse, and equipment) are generally subpar to those at equivalent sized commercial organizations due to external performance metrics that publicize how much of each donated dollar is used to cover overhead expenses of the organization. Hence, one can argue that creative people who can come up with innovative processes to improve operational efficiencies are needed even more in humanitarian organizations compared to commercial organizations that have relatively more resources. Yet, food banks are unable to engage in extensive human resource management and in most cases have to rely on a volunteer workforce. Food spoilage due to supply chain inefficiencies is also more costly in a food bank environment as resilience is not easily gained due to a lack of alternatives. Thus, while at a high level, food banks may appear to be similar to commercial firms that distribute food, there are several key areas that differentiate the operations of a food bank:

- (1) Food banks face greater variety and uncertainty in their supply of funding and food items.
- (2) Food banks work with a greater variety of partners to distribute food items.
- (3) Food banks have different objectives and more resource constraints.
- (4) Food banks are more constrained in terms of managing talent within the organization.
- (5) In food banks, the power of final customer (i.e., underprivileged communities) is limited.

To gain further insights into the operations of food banks and how they differ from for-profit organizations, we engaged in an exploratory case study with a food bank (Harvest Hope Food Bank). Our interview with the Chief Operating Officer (COO) of the food bank highlighted the importance of supply, demand, and internal integration—the three constituent aspects of supply chain integration (SCI). We were informed that SCI varies greatly from one food bank to another, yet the three types of integration are critical for improving food bank performance. According to the COO, the ability of food banks to marshal their limited human, organizational, and relational assets is crucial for strengthening SCI. The COO noted that unlike for-profit organizations, food banks are severely constrained in terms of their organizational assets (such as institutionalized knowledge base) and their abilities for managing talent. Hence, it is important to channel organizational and human assets to create a higher level capability that relies on synergy and collaborative advantage. In a keynote talk delivered at the Production and Operations Management (POMS) Conference in 2012, the Chief Executive Officer of the Global Foodbanking Network also emphasized the criticality of synergizing organizational and human assets for making a change in the food banking industry. Drawing upon these and other opinions and observations of practicing professionals in the food banking sector, it is apparent that carefully managing organizational

and human assets toward the organizational mission is critical for self-sustaining the operations of these humanitarian organizations.

SCI is considered to be a set of elements in operations that can be used to help find solutions for inefficiencies (such as the bullwhip effect) and develop streamlined processes by coordinating organizational activities internally and externally (Ataseven & Nair, 2017; Leuschner, Rogers, & Charvet, 2013; Mackelprang, Robinson, Bernardes, & Webb, 2014). The rich empirical SCI literature shows that integration practices lead to improvements in operational and financial performance. However, the extent of empirical SCI research in humanitarian organizations is limited. We come back to the reasons why this is the case later in the manuscript.

Theoretically, organizational and human assets are associated with the notion of intellectual capital (IC) (Nahapiet & Ghoshal, 1998; Subramaniam & Youndt, 2005). IC relates to the knowledge-based view (KBV), which asserts that knowledge is the most important strategic resource of an organization (Chakravarthy, McEvily, Doz, & Rau, 2003; Eisenhardt & Santos, 2002). Hsu and Sabherwal (2012) discuss the interrelated nature of IC and knowledge management (KM) in the organization, and empirically test the impact of IC and KM on each other as part of their model to understand how knowledge and processes for managing knowledge affect each other. Nahapiet and Ghoshal (1998) employ IC “to refer to the knowledge and knowing capability of a social collectivity, such as an organization, intellectual community, or professional practice.” (p. 245). Janz and Prasarnphanich (2003) emphasize how organizations strive to achieve effective utilization of knowledge and expertise (IC) that reside in employees and study knowledge-centered culture as an antecedent of effective KM. While organizations have different ways of accumulating and using knowledge, IC refers to all the knowledge that organizations utilize to gain a competitive advantage. Subramaniam and Youndt (2005) conceptualize IC on three dimensions. “Human capital is the knowledge, skills, and abilities residing with and utilized by individuals, whereas organizational capital is the institutionalized knowledge and codified experience residing within and utilized through databases, patents, manuals, structures, systems and processes” (p. 451). The third aspect of IC is social capital, which is the knowledge that emerges through interactions between individuals and their interrelationships. Although the dimensions of IC may sound different, they transform into, and are transferred via, each other, and ultimately unfold the organizational knowledge (Subramaniam & Youndt, 2005). Combining the insights from our exploratory studies of the field with this existing theory, we note that, within the context of food banks, it is unclear how these three capitals—human, organizational, and social—interrelate with each other for creating conditions for superior performance. It is this interrelationship between human, organizational, and social capital and their impact on SCI that forms the key research focus of this study.

To inform our research, we collected survey data from food bank executives (representing 54.5% of the food banks that are members of Feeding America) during the period of September 2012–May 2013. Moreover, members of the author team visited Harvest Hope Food Bank (SC), Food Bank for Westchester (NY), Island Harvest (NY), City Harvest (NY), Food Bank for NYC (NY), and

Community Food Bank of NJ (NJ) to make direct observations and exchange information with food bank executives in person. One executive indicated that even though food banks generally collaborate and dedicate the resources to alleviate hunger in their service areas, sometimes, there is a level of friction with neighboring food banks, which generates competition for a limited pool of financial and volunteer support. In this environment, better performance and effectiveness become the distinguishing factors that help food banks collect more support in terms of food and volunteers. Considering the idiosyncrasies in this environment, food banks are in a position to determine key success factors and make strategic decisions regarding which critical areas to invest in order to survive and thrive in their constrained settings. SCI is one strategic approach to generate and maintain an efficient and effective supply chain. It is well known that information-processing capabilities have become increasingly important in highly uncertain environments. Given that food banks operate under a large amount of uncertainty, integration with partners and having access to information help alleviate the vulnerability caused by the unpredictable environment the organizations operate in. Although the benefits of SCI have already been studied and validated in for-profit enterprises, there is a lack of empirical validation of SCI in the humanitarian context. One contribution of our study lies in filling this gap. The drivers of SCI in humanitarian settings should be considered differently due to the resource constraints that limit the ability to invest in various staff and organization-related capabilities in this setting. We hypothesize that humanitarian organizations should channel their limited human and organizational capital (*vis-à-vis* for-profit organizations) toward creating superior social capital. It is by virtue of this social capital (built by means of human and organizational capital) that food banks can best achieve their desired level of SCI. By means of our research, we elaborate and explain the role of social capital along with other dimensions of IC by testing the influence of IC as a whole in terms of building SCI while also examining the relationships among human, organizational, and social capital.

While commercial organizations succeed in achieving SCI with more money, resources, training, development, and investment in information technology, humanitarian organizations often integrate with supply chain partners with fewer resources, capital, databases, and a different form of social capital that is built on goodwill and a common social goal rather than networks that emerge for commercial organizations. As food banks are resource-constrained organizations, managers need to work carefully to achieve efficiencies via SCI and make prioritizations to gain the maximum benefit from their investment decisions. We provide a more detailed discussion of the managerial implications of our study after presenting the results.

Some factors may explain the limited number of empirical research investigating SCI in humanitarian organizations. First, data collection pertaining to SCI in not-for-profit organizations is more difficult than in the for-profit context because the SCI concept is still in its infancy in not-for-profit organizations. In addition, not-for-profit organizations typically strive to use as much of their operating budgets as possible to meet the primary needs of their recipients. Thus, not-for-profit supply chains often staff much “leaner” than their for-profit counterparts, resulting in managers at nonprofit organizations having less discretionary time to respond to

surveys or interview requests. Second, while SCI has been considered as a strategic approach that improves a firm's profitability, the performance measures used by not-for-profit organizations often do not lend themselves to a direct generalization of this previous research. Thus, there is a need for transferring and extending the lessons learned from the private sector to these not-for-profit organizations and utilize cross-learning possibilities between these sectors (Van Wassenhove, 2006) so as to enable nonprofits to achieve performance goals that transcend beyond maximizing profits (Akingbola, 2006). Our study addresses this theoretical void by considering SCI in the unique context presented by the food bank industry in the United States. To the best of our knowledge, this is the first study that empirically investigates the interplay of human, organizational, and social capitals in the humanitarian context and investigates the role played by the resulting IC as an antecedent of SCI.

THEORY AND RESEARCH HYPOTHESES

Supply Chain Integration and Intellectual Capital in Humanitarian Organizations

Supply chain integration

The concept of SCI has received substantial scholarly attention in the research literature spanning over more than a decade (Das, Narasimhan, & Talluri, 2006; Frohlich & Westbrook, 2001; Schoenherr & Swink, 2012). SCI has generally been classified into two dimensions—internal integration and external integration. Internal integration involves information synchronization and integrative initiatives between the functions within an organization. External integration, in contrast, relates to the level of collaboration of an organization with its upstream suppliers and its downstream customers (Braunscheidel & Suresh, 2009). Flynn, Huo, and Zhao (2010) define SCI as the degree of an organization's strategic collaboration with its customers and suppliers, and management of intra- and interorganizational processes. The benefits of collaboration between supply chain partners as well as the integration between the functions within an organization have been shown to impact operational and financial performance in several research studies (Braunscheidel & Suresh, 2009; Swink, Narasimhan, & Wang, 2007).

Internal integration is a challenging task in food banks, which are typically organized with a management layer supported by volunteers who help in day-to-day operations. The resource constraints and the nature of the business often do not allow a large organizational structure. However, there is a need for coherent collection of teams in the food bank organization in various functions including but not limited to sorting, member relations, planning, and volunteer coordination.

Supply integration takes shape with partners such as farms, manufacturers, distributors, volunteer organizations, and retail stores. This integration helps food banks better plan for the quantities that they could expect to receive and the timing of the delivery of products. The food bank's ability to manage activities such as coordination of receiving, warehousing, and inventory management determines level of supply integration achieved by the food banks. The level of technology used by food banks such as radio frequency identification systems to exchange

information and integrate with suppliers is different from one food bank to another, exemplifying the variability in the level of supply integration in this context.

The ability of food banks to coordinate the downstream distribution tasks such as dispatching, shipping, and outbound inventory management is dependent on the level of coordination with outbound external partners such as soup kitchens, food pantries, churches, etc. The exchange of information with these distribution agencies (e.g., quantities that these agencies can, in turn, distribute to the underserved communities), the geographic reach that the food banks can manage with these external partners, and the need for transportation and shipping capabilities in a food bank setting ultimately determine the demand integration.

SCI mainly focuses on information exchange, teamwork, building relationships, and close connections that go beyond day-to-day transactions. Thus, knowledge sharing is one of the main characteristics of SCI because both internal and external integration emphasize information exchange and interactions between parties that engage in supply chain activities to achieve a common understanding. KBV, which was derived from the resource-based view (RBV), argues that knowledge is the most important strategic resource of an organization (Chakravarthy et al., 2003; Eisenhardt & Santos, 2002). The factor that gives knowledge this critical position is that it is not imitable. RBV asserts that organizations seek valuable, rare, inimitable, and nonsubstitutable resources to achieve competitive success (Dierickx & Cool, 1989). Human- and knowledge-based resources are strategic in the sense that they bring in the skills, practices, knowledge, and capabilities that add value to the organization, and are either unique or rare among the organizations in the industry (Wright & McMahan, 1992). Employees and volunteers of humanitarian organizations make a difference by dedicating themselves to the cause and coming up with creative processes through good use of information and sophisticated problem-solving skills. This directly influences the development of valuable and unique resources that cannot be easily replicated.

The scholarly works in the area of SCI have greatly enhanced our understanding of the concept but an examination of the literature indicates that SCI has been primarily examined in the context of private sector enterprises. Thus, an understanding of the nature and potential of SCI for organizations engaged in serving social causes is a relatively underresearched domain. Similar to private enterprises, organizations addressing issues such as hunger, health, and poverty are required to manage the steady flow of materials, services, and information to achieve their social goals (Akingbola, 2006). Yet, these organizations face unique budgetary, infrastructural, and personnel constraints requiring innovative approaches for managing their operations.

Holguin-Veras, Jaller, Van Wassenhove, Perez, and Wachtendorf (2012) point out that the number of empirical studies in humanitarian logistics is quite small. Compared to commercial supply chains, the total number of nonprofit supply chain organizations is much smaller, so obtaining an adequate sample size of respondents for statistical analysis often requires the collection of data from a relatively large percentage of the total number of organizations. This could be one reason the amount of empirical research on the subject is limited. While there are direct adaptations of models and frameworks from the commercial to the humanitarian domain, these one-to-one adaptations have limitations (Holguin-Veras et al.,

2012). There is a growing interest in empirically studying humanitarian supply chains that host idiosyncratic relationships between humanitarian organizations, suppliers, and beneficiaries. These relationships are often not based on economic exchanges; they are conditional on the current needs, which require the organization's operational decisions to rely more on human factors. Thus, there have been calls for more empirical studies that consider relationship building, culture, and the human element in humanitarian operations in this nontraditional (noncommercial) setting (Kovacs & Spens, 2011).

Intellectual capital

Knowledge assets have gained considerable attention as a source of competitive advantage over the past few decades. Various terms are used to describe these assets such as IC, knowledge capital, learning organizations, information assets, intangible assets, and hidden value (Bontis, 2001). Specifically, IC is studied by several researchers and is considered as a driver of both financial and nonfinancial performance. IC is all the knowledge organizations utilize to gain a competitive advantage (Subramaniam & Youndt, 2005) and the three most commonly defined dimensions of IC are human, organizational, and social capital (Subramaniam & Youndt, 2005). Some studies also consider customer capital and structural capital as dimensions of IC as well (Bontis, 2001). Thus, knowledge sharing processes that go beyond the boundaries of the organization are also included in this form of capital.

Some argue that the measurement of knowledge assets is not straightforward because their indicators are idiosyncratic and the strategic goals of an organization should be guiding the choice of metrics for these types of intangible assets (Bontis, 2001). For most humanitarian aid organizations, value is created with inputs from many stakeholders. Specifically for food banks, these stakeholders include the donors (both companies and individuals), government, volunteers, other nonprofit agencies, and clients. Thus, the knowledge and capabilities of individuals, along with the codified experience that is preserved in systems and structures of an organization, are facilitated by and utilized through the networks of interrelationships (Nahapiet & Ghoshal, 1998).

The literature on IC emphasizes that the productive power of an organization mainly resides in its intellectual and service capabilities rather than its hard assets such as land, equipment, and machinery (Nahapiet & Ghoshal, 1998). Given the constraints of humanitarian aid organizations, in general, and food banks, in particular, the importance of knowledge and smart solutions with scarce resources is magnified. Nahapiet and Ghoshal (1998) state that the social dimension of IC particularly stands out as an enabler for exchange and is instrumental in systematizing knowledge-based resources into arranged systems of knowledge (Nahapiet & Ghoshal, 1998). They then suggest that social capital encourages cooperative behavior. In general, social capital drives the mechanism that generates IC by facilitating engagement, exchange, and combination of knowledge, while network ties provide access to resources for combination and exchange of knowledge. In a humanitarian aid context, social capital paves the way for a willingness to be engaged in the common goal and cooperative action. In this

environment, group members are able to trust each other, cooperate, and coordinate to solve problems. Therefore, there are synergies created and efficiencies gained with the help of social capital. This is especially crucial in a highly constrained environment with large amounts of uncertainty on both supply and demand.

Moreover, social capital facilitates the actions of individuals and increases the efficiency of action (Nahapiet & Ghoshal, 1998). In contrast to the for-profit setting in which the social capital has been conceptualized to directly link with SCI (Menor, Kristal, & Rosenzweig, 2007), in a humanitarian context, we assert that human capital and organizational capital are building blocks of social capital. Further, social capital is the key enabler of SCI in not-for-profit organizations because it facilitates “identification”—the process through which members of a group take the values or standards of other group members as their frame of reference (Nahapiet & Ghoshal, 1998). Identification is a part of the relational dimension of social capital along with trust, norms, obligations, and expectations. Nahapiet and Ghoshal (1998) also propose that identification with a community or a group intensifies the concern for collective goals and associated outcomes, and it becomes a resource that impacts the expectation of value to be achieved via knowledge exchange and increases the motivation to exchange knowledge. Given that goodwill is an important driver of operations in food banks, a sense of belonging and dedication to a humanitarian cause connect people and enable the identification aspect of social capital. The norms of social capital transform individuals from self-seeking agents into members of a group that has an identity, shared interests, and a commitment to a common good (Adler & Kwon, 2002). Teamwork, information exchange, joint decision making, and shared understandings ensue to meet the social goal of food delivery to the communities in need.

In sum, IC in humanitarian context helps organizations respond to the operational issues in the challenging and constrained not-for-profit environment (Kong, 2007). Human capital manifested in the form of a bright workforce working for the food banks is instrumental in finding efficient solutions to day-to-day operations and strategically addressing the hunger problem in the service area of the organization. Organizational capital is the institutional knowledge existing in the food bank that is stored in manuals, databases, and reports. For instance, food banks have volunteer manuals, agency manuals, and various forms and databases that store and convey information about food bank operations. Finally, social capital, which emerges through interactions between individuals and their interrelationships, is, perhaps, the most critical element of IC in the context of humanitarian organizations. Social capital of food banks enables consensus formation and focuses on the common goal of ending the hunger problem in the society.

To the best of our knowledge, this study is the first that investigates the role of IC in its totality as the driver of SCI. Although social capital has been considered in relation to SCI in the literature, we examine all of the dimensions of IC as the driver of SCI in humanitarian organizations. Moreover, we suggest relationships among these dimensions and theorize how social capital mediates the relationship of SCI with human capital and organizational capital. We empirically validate the proposed relationships using data from food banks. Next, we discuss our research hypotheses.

Research Hypotheses

Social capital is an asset reflecting the characteristics of social interactions achieved through the collection of individual-level understandings regarding the tasks and goals. It emerges from norms of collaboration, interaction, and sharing of ideas. This form of IC does not follow predetermined rules for knowledge transmission; instead, it requires structures that facilitate the interactions in networks. Organizations recruit employees based on their skills and their abilities to solve problems (Leana & Van Buren, 1999). Since the social capital represents embedded knowledge available through the interrelationships and interactions of the individuals (Reed, Lubatkin, & Srinivasan, 2006; Subramaniam & Youndt, 2005; Youndt, Subramaniam, & Snell, 2004), the accumulation of the right human actors with their abilities and resources plays an important role in developing necessary social capital in the organization. Employees decide to work for humanitarian aid organizations so that they can contribute to the society and achieve certain meaningful results (Drucker, 1989). Also, the aspirations, personalities, and motivations of the individual human actors that target a common social goal present a context, where the knowledge, experiences, and know-how are exchanged willingly, and collaboration and teamwork happen naturally. We posit that the human capital, manifested in terms of skilled, creative, and intelligent workforce, is the prerequisite for building the social dimension of IC. Training, education, and motivation of individuals of the organization influence interactions and interrelationships between the employees in food banks. Food banks rely on individuals that are dedicated to a common cause, which is the social goal of ending hunger. These individuals share ideas and norms of collaboration in the organization thereby impacting the social capital. Therefore, we hypothesize:

H1: *Human capital is positively associated with the level of social capital in food banks.*

As human capital reflects collective expertise of individuals in an organization, it may not necessarily stay within the organization due to the mobility of employees. As a result, human capital can come and go from the organization. In contrast to human capital, organizational capital focuses on the codification and preservation of knowledge by means of manuals, databases, patents, and licenses. Additionally, it also emphasizes the establishment of structures, processes, and routines that encourage the repeated use of this knowledge (Hansen, Nohria, & Tierney, 1999). As such, organizational capital, which takes the form of institutionalized knowledge, stays within the organization and manifests in the form of structured and repetitive activities, as well as formal procedures and rules for retrieving, sharing, and utilizing knowledge.

In essence, organizational capital aims to institutionalize knowledge within an organization by means of preserving knowledge and by incorporating mechanisms to use it recurrently. It calls for a cross-functional information exchange and also aids in developing a common understanding of the supply chain operations and metrics. An organization's existing knowledge base is used in structured and recurrent activities as a reliable and robust response, as it influences the problem-solving patterns that take place in the organization (Subramaniam & Youndt, 2005).

In general, recurrent processes and routines leveraged on the organization's preserved knowledge are expected to enhance the level of interactions, relationships, and collaborations among the individuals that deploy the organizational knowledge. This is especially true for the projects that require collective work of the individuals. This provides a context, where the organization's codified knowledge (e.g., in databases, patents, and licenses) is put to use, updated, and reinforced (Subramaniam & Youndt, 2005). Organizational capital comprises of structures, standardized processes, routines, formalization of rules, and procedures (Subramaniam & Youndt, 2005), and is mostly mechanistic (Kang & Snell, 2009). These structures create a resource for the employees to refer to as an institutionalized, reliable, and legitimate codebook, and help in the organizational learning processes. The organizational capital that is available minimizes the time it takes to understand and interpret issues to be resolved in the organization (Kang & Snell, 2009). In addition, these sources define the protocols and implementation of processes and guide the interactions that take place within and across the organization. Food banks provide manuals, general rules, and guidelines to their workforce as well as to their supply chain partners to describe the process and transfer the knowledge. For instance, some food banks provide operation guidelinesⁱ to cover the essentials and reporting requirements such as the identification of clients, distribution policies, daily tasks, orders and inventory records, alternate sources of food, food safety, storage, donation documentation, emergency plan, volunteer management, commitment, and training. In essence, organizational capital provides references for various aspects of the operation, and this set of information is influential in building and strengthening the embedded knowledge. This facilitates the evolution of social capital as a network of connections that embody the operational knowledge. Thus, we hypothesize:

H2: *Organizational capital is positively associated with the level of social capital in food banks.*

Supply integration with farms, manufacturers, distributors, and retail stores enable food banks to be prepared in terms of the quantities that they could expect to receive and the timing of the delivery of food. The ability of the management staff and volunteers to work together to coordinate receiving, warehousing, and inbound inventory management activities associated with the supplies is dependent on the level of supply integration with external partners. Since food banks and external partners, such as donor companies, individuals, volunteers, strive toward alleviating hunger, intense communication, and interaction among members, create an environment that helps in reaching consensus with the suppliers (of funds as well as food) regarding common metrics and understanding of the ultimate social goal. Social capital emphasizes close relationships and partnerships with external parties to develop solutions. The literature indicates that interorganizational networks and social embeddedness help firms achieve not only new skills and capabilities but also access fine-grained information (Adler & Kwon, 2002). Specifically, it has been shown that social capital strengthens supplier relations in for-profit settings (Adler

ⁱ <https://www.midohiofoodbank.org/who-we-are/agency-zone/https://www.midohiofoodbank.org/wordpress/wp-content/uploads/2016/07/MOF-Pantry-Manual-Template.pdf>

& Kwon, 2002). Bridging forms of social capital, as opposed to bonding forms of social capital that emphasize internal ties within groups, is considered as a resource with a focus on external relationships whereby the direct and indirect connections of individuals to other actors facilitate their actions. This perspective suggests that differential success can be explained through the practices that result from the existing social capital (Adler & Kwon, 2002). The same logic applies here as the social capital will be an enabler for close connections with suppliers by setting the norms of collaboration. Since communication is essential for gaining and maintaining support from suppliers, food banks publish reports, newsletters and statements regarding their operations to inform the donors, convey information, establish trust, and show how the expectations as to the mission of the food bank are met. Hence, we hypothesize:

H3: *Social capital is positively associated with the level of supply integration in food banks.*

Similarly, on the outbound distribution side, the ability of food banks to coordinate the distribution tasks such as dispatching, shipping, and outbound inventory management should be reliant on a clear understanding of their relationships with external partners such as soup kitchens, food pantries, churches, etc. Demand integration provides a sense of the abilities of these distribution agencies (e.g., quantities that these agencies can, in turn, distribute to the underserved communities), the geographical reach that the food banks can manage with these external partners, and the need for transportation and shipping capabilities to be developed through close relationships with their partners.

The level of social capital that is present in the food banking organization is a driving factor in establishing demand integration. The alignment and the interactions among the members of a food bank toward the needs of demand side of the supply chain would make it possible to manage client relationships more effectively and coordinate the delivery plans according to the client requirements. The core intuition of social capital is deemed to be goodwill, which includes trust and sympathy between the entities, and this intuition makes information, influence, and solidarity available to members of a social structure (Adler & Kwon, 2002; Gooderham, Minbaeva, & Pedersen, 2011). This is especially valid in a humanitarian context such as a food bank supply chain. The member agencies and clients that take part in the downstream food bank supply chain convey the requirements and needs to the food bank. This helps the food bank to serve its clients in a timely fashion. In essence, the solution oriented partnerships with customers resulting from the social capital aid in achieving demand integration. Accordingly, we hypothesize:

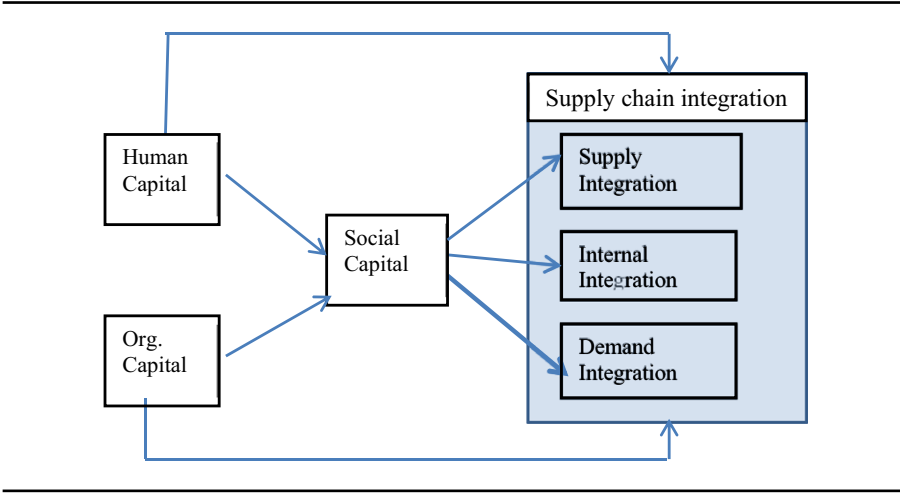
H4: *Social capital is positively associated with the level of demand integration in food banks.*

In general, organizations that can utilize knowledge effectively are more likely to coordinate and combine their assets in new and distinctive ways, providing value-added products and services for their clients (Kong, 2008; Teece, Pisano, & Shuen, 1997). This is particularly accurate for the utilization of tacit knowledge (Kong, 2008). Social capital expands the collection of knowledge that

is embedded in various sources, including the human resources as well as structures and systems, and channels the emergent interactions toward collaboration and teamwork, thus improving the level of internal integration in food banks. By definition, internal integration emphasizes a deliberate effort toward teamwork and information exchange between the functions of an organization (Schoenherr & Swink, 2012), and the team members will turn to sharing expertise and internal resources to arrive at potential solutions. The need to get quick answers to the questions that arise in the field, not limited to food banks but for humanitarian operations in general, requires effective interaction between coworkers (Tomasini & Van Wassenhove, 2009; p. 104). Social capital increases the efficiency of action and encourages cooperative behavior (Nahapiet & Ghoshal, 1998). In essence, social capital enables interfunctional teamwork, consensus on common metrics, and an understanding of the ultimate social goal. Therefore, we hypothesize:

H5: *Social capital is positively associated with the level of internal integration in food banks.*

Social capital is a facilitator for exchange in a relational structure and exchange is deemed as a driver of combination of resources because it enables engagement, exchange, and combination of knowledge (Nahapiet & Ghoshal, 1998). Both human and organizational capital are utilized and transferred via interactions that occur in networks (Subramaniam & Youndt, 2005). Social capital presents the foundation to exchange knowledge residing in various sources. The skilled workforce that a food bank attracts and retains will be the source of innovation and productivity, both of which are extremely crucial in a resource-constrained setting (Kong, 2008). However, an organization would not be able to experience all the best practices and process outcomes from the skilled workforce if there is no facilitating mechanism that enables the human actors to communicate and interact with one another as well as with clients, suppliers, and agencies. The social capital channels the emergent interactions among employees of food banks and their counterparts in the supply chain toward collaboration and teamwork. Moreover, food banks do not rely only on human actors for the daily operations to run seamlessly. The existing structures, systems, procedures, manuals, rituals, stories, and documentation also play vital role in undertaking supply chain management tasks. This knowledge base (organizational capital) needs to be translated by the mechanisms of knowledge sharing and collaborative relationships into an integrated approach for meeting the social goal. The networking aspect of social capital emphasizes the connections that are vital for sharing of ideas and exchanging information with external partners as well as within an organization. Hence, social capital acts as a facilitator and transfers both human and organizational capital via interactions that occur in networks into resulting practices and processes (Subramaniam & Youndt, 2005). Knowledge, skills, and abilities of the people of food banking organization crystallize as the members of the group go through an identification process by embracing the values of other members and using them as standards for their actions toward common social goal. This process happens naturally as fundamentally the values of other members are in line with the members' own norms and expectations; they just get reinforced through the interactions and knowledge

Figure 1: Conceptual model.

exchange with the engaged parties. Social capital encourages the exchange of ideas and interactions among human resources and hence acts as a conduit for linking human capital with SCI practices. By creating common social norms, it also enables the effective transfer of codified information, which helps in linking organizational capital with SCI practices. In essence, social capital promotes trust and facilitates intellectual exchange. The resulting relational embeddedness is particularly beneficial in the face of uncertainty (Moran, 2005). Uncertainty surrounding food bank operations distort the accuracy of information, but the relational norms developed by means of social capital eliminate this vulnerability and enable strategic collaboration internally and externally with partners. Therefore, we hypothesize:

- H6:** *Social capital mediates the relationship between human capital and (a) supply integration, (b) demand integration, and (c) internal integration.*
- H7:** *Social capital mediates the relationship between organizational capital and (a) supply integration, (b) demand integration, and (c) internal integration.*

We present the overall theoretical model in Figure 1.

RESEARCH DESIGN

Data Collection and Sample Characteristics

It is quite common in the literature to employ a survey methodology to measure SCI (e.g., Koufteros, Vonderembse, & Jayaram, 2005; Schoenherr & Swink, 2012; Swink et al., 2007) because the constructs in this domain are mostly latent. Similarly, the various types of capital within the IC framework are not readily quantifiable through other means (Subramaniam & Youndt, 2005). The unit of analysis in this study is a food bank. We obtain survey responses from food bank

executives who are in charge of operations and are familiar with the human and informational resources within the food bank as well as have an understanding of the relationships among organizational members.

An online survey instrument was sent to U.S.-based food banks that are members of Feeding America network. At the time of data collection in 2012–2013, 202 food banks spanning all 50 states of the United States were part of this network. The scales for the SCI constructs are adapted from the previous studies in supply chain management (Koufteros et al., 2005; Schoenherr & Swink, 2012; Swink et al., 2007), and IC scales are adapted from the management literature (Subramaniam & Youndt, 2005). The measurement items for the survey are presented in the Appendix.

To ensure content validity, the survey was initially reviewed by the COO of a local food bank. He was requested to go through the survey, indicate if there was any ambiguity, and record the time it took to complete the questionnaire. Some changes were made according to his inputs to ensure readability and clarity. Then, the first wave of the Web-based survey was conducted. An initial e-mail was sent to the food bank executives to introduce the study, which was followed by a Web link to access the survey if the executive agreed to participate. If there was no response in about a week, reminder e-mails were sent.

Some food bank executives declined the invitation to participate in this study indicating reasons such as “very busy,” “not interested,” or “length of the survey.” The potential respondents were asked to complete the survey by a certain date to be eligible to enter a drawing to win a gift donation. Moreover, the food bank executives were also offered an executive report once the project was completed. These incentives were provided to increase the response rate, which is known to be a concern in organizational survey research (Baruch & Holtom, 2008). The first wave of survey was completed by 36 food bank executives. While this response represented 17.8 % of the members in the Feeding America network, the number of responses was not high enough to conduct rigorous statistical analysis. Hence, a second wave of e-mail communication was sent 2 months later. Additionally, one of the authors personally visited several food banks to record survey responses from food bank executives. This face-to-face interaction with food bank executives was useful, because the respondents could clarify their questions and learn more about the project. For the second wave, the data collection resulted in 74 additional responses, increasing our total sample size to 110 with a response rate of 54.5%. This response rate is appropriate for survey research in operations management, surpassing the 20% response rate level recommended in the literature (Malhotra & Grover, 1998), and is also much higher than the average observed response rates in the field.

In order to check for nonresponse bias, we conducted several *t*-tests assuming that the responses of the late respondents were representative of the nonrespondents (Armstrong & Overton, 1977). The early-wave and the late-wave respondents were compared using “Age” and “Warehouse Size” as well as two randomly selected construct measurement items to test whether nonresponse bias was a problem in the sample (Chen, Paulraj, & Lado, 2004). The *t*-test results indicated no statistically significant differences between the first-wave and second-wave responses at the 0.05 level (difference in “Age”: 95% CI—[−2.60, 2.47], difference in “Warehouse

Table 1: EFA results for intellectual capital constructs.

Item	Human Capital	Organizational Capital	Social Capital
HUM1	0.638	0.049	0.216
HUM2	0.689	0.324	−0.101
HUM3	0.738	−0.083	0.278
HUM4	0.919	−0.008	−0.161
HUM5	0.638	−0.111	0.375
ORG1	−0.061	0.906	−0.053
ORG2	0.105	0.598	0.239
ORG3	0.271	0.723	−0.047
ORG4	−0.110	0.909	0.058
SOC1	0.074	0.062	0.817
SOC2	0.036	0.056	0.781
SOC3	−0.199	0.051	0.954
SOC4	0.084	−0.077	0.797
SOC5	0.208	0.021	0.652

Principal components factor analysis with Promax rotation and Kaiser normalization.

Size”: 95% CI—[−26,061.98, 22,154.95], difference in measurement item for “Organizational Capital”: 95% CI—[−0.51, 0.67], and difference in measurement item for “Supply Integration”: 95% CI—[−0.73, 0.55]). Since all of these confidence intervals include zero, we fail to reject the null hypotheses that the mean differences for these variables are zero, even after making a Bonferroni correction to *p*-values using multiple comparison adjustment to consider the *t*-tests altogether. Thus, the results support that nonresponse bias is not a problem in the data.

Common method bias is tested using Harman’s single-factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). If there is a substantial common method variance caused by using a single method of data collection (survey), a single factor is expected to emerge when all the measurement items of variables are entered into an exploratory factor analysis (EFA). All the items could not be included in the factor analysis because of the sample size and the number of variables in this study. Instead, two separate factor analyses were used to satisfy the subjects to variables ratio of 5 (Arrindell & Van der Ende, 1985), the first with IC items and the second with SCI items. The first factor analysis conducted on 14 items using principal component factor analysis and Promax rotation with Kaiser normalization resulted in three factors with eigenvalues greater than 1. Moreover, as the established theory suggests three dimensions of IC and the Scree plot also supported a three-factor solution, we proceeded with a three-factor solution. The second-factor analysis with 17 items using principal component factor analysis and Promax rotation with Kaiser normalization yielded four factors that have an eigenvalue greater than 1. The theory suggests three dimensions of SCI and a three-factor solution was supported by a Scree plot as well. Hence, we proceeded with a three-factor solution for SCI. These results provide evidence that common method variance is not a problem in the dataset. The results of the EFAs are presented in Tables 1 and 2.

Table 2: EFA results for supply chain integration constructs.

Item	Internal Integration	Demand Integration	Supply Integration
INT1	0.558	0.195	0.089
INT2	0.672	0.063	0.153
INT3	0.831	−0.018	0.002
INT4	0.817	0.016	0.008
INT5	0.823	0.043	−0.006
INT6	0.625	0.186	−0.060
DEM1	−0.014	0.674	0.097
DEM2	−0.056	0.810	0.063
DEM3	0.285	0.744	−0.235
DEM4	0.091	0.776	0.000
DEM5	0.171	0.536	0.163
SUP1	−0.098	0.391	0.524
SUP2	−0.043	0.281	0.722
SUP3	0.247	−0.040	0.720
SUP4	0.362	−0.131	0.639
SUP5	0.328	−0.216	0.527
SUP6	−0.226	0.071	0.863

Principal components factor analysis with Promax rotation and Kaiser normalization.

Measurement, Validity, and Reliability

Similar to the exploratory factor analyses we ran two confirmatory factor analyses (CFAs). The first one included the items representing IC, and the second one considered items for SCI. The CFA model for IC yielded fit indices of CFI = 0.93 and TLI = 0.91. The $\chi^2/\text{d.f.}$ ratio is 1.84 (128.457/70), AIC = 3,497.851, BIC = 3,627.895, RMSEA = 0.09, and SRMR = 0.08. The CFA for SCI constructs yielded CFI = 0.89, TLI = 0.87, $\chi^2/\text{d.f.}$ ratio of less than 2 (216.813/116), AIC = 4,940.596, BIC = 5,084.422, RMSEA = 0.09, and SRMR = 0.07. These values reasonably conform to generally recommended goodness of fit (Bollen, 1989; Sharma, Mukherjee, Kumar, & Dillon, 2005). The standardized factor loadings are presented in Tables 3 and 4.

Construct validity is the assessment of the degree to which a particular measure actually captures the latent construct of interest. The most efficient measures are manifestations of constructs that take place in articulated theory and are supported by empirical data (Netemeyer, Bearden, & Sharma, 2003, p. 8). The measures used in this study resulted from an extensive literature search. Moreover, since the measures were adopted from the previous studies, they have been evaluated by academics over the years as the literature has developed and the scales have been refined (Netemeyer et al., 2003, p. 8). Further, as mentioned earlier, the survey instrument used for this study was assessed by a knowledgeable practitioner to verify the face validity of the items. We believe that all these steps collectively strengthen the validity of the scales used in this project.

We also assessed the discriminant validity of the constructs to evaluate the degree to which the constructs of interest are distinct from each other. In order to

Table 3: Standardized CFA path loadings for intellectual capital constructs.

Item	Human Capital	Organizational Capital	Social Capital
HUM1	0.777		
HUM2	0.678		
HUM3	0.868		
HUM4	0.665		
HUM5	0.818		
ORG1		0.794	
ORG2		0.646	
ORG3		0.831	
ORG4		0.841	
SOC1			0.880
SOC2			0.792
SOC3			0.768
SOC4			0.737
SOC5			0.760

Table 4: Standardized CFA path loadings for supply chain integration constructs.

Item	Internal Integration	Demand Integration	Supply Integration
INT1	0.660		
INT2	0.714		
INT3	0.754		
INT4	0.772		
INT5	0.799		
INT6	0.651		
DEM1		0.662	
DEM2		0.723	
DEM3		0.810	
DEM4		0.792	
DEM5		0.701	
SUP1			0.577
SUP2			0.780
SUP3			0.796
SUP4			0.779
SUP5			0.545
SUP6			0.612

conduct this analysis, we compare two CFA models, one in which the correlation between the latent variables is set equal to 1, and another in which the correlations are set to be free. When the two models were compared, a significantly lower χ^2 value for the unconstrained model with respect to the constrained model indicates discriminant validity (O'Leary-Kelly & Vokurka, 1998). For the IC block, the χ^2 value for the constrained model is 407.55 with 77 degrees of freedom. The χ^2 difference test indicated that the unconstrained model explains the data better, thereby lending support for the discriminant validity of the IC construct. Likewise,

Table 5: Reliability results for the constructs.

Construct	Number of Measurement Items	Cronbach's alpha	Average Variance Extracted
Human Capital	5	0.870	0.586
Organizational Capital	4	0.852	0.611
Social Capital	5	0.890	0.622
Internal Integration	6	0.860	0.529
Demand Integration	5	0.847	0.547
Supply Integration	6	0.838	0.476

for the integration block, the χ^2 value for the constrained model is 460.23 with 119 degrees of freedom. The χ^2 difference test indicates a better fit for the unconstrained model, thereby establishing discriminant validity for the construct.

Convergent validity is assessed by examining the factor loadings on the latent constructs (Hair, Anderson, Tatham, & Black, 1998). As all the item loadings on their respective latent constructs are in excess of 0.5, we establish convergent validity of the constructs. Moreover, each indicator's estimated path coefficient on the respective underlying factor is greater than twice its standard error, indicating that the coefficients are significantly related to their respective constructs (Anderson & Gerbing, 1988).

Finally, we assess the reliability of the constructs by means of Cronbach's alpha. As can be noted in Table 5, the scale reliabilities of all our constructs are above the suggested cutoff value of 0.70 (Nunnally, 1978).

Research Methodology

Although 110 responses out of 202 food banks targeted for the study are quite comprehensive, the number of responses limits the ability to estimate the parameters using structural equation modeling (SEM) technique. Partial least squares (PLS) could potentially be another alternative to SEM due to the small number of responses to the number of estimated coefficients ratio because it is a technique commonly used when the sample size is small. However, PLS is generally utilized for exploratory purposes and is not free from certain disadvantages. For instance, in PLS, model errors are not taken into account, and this would lead to biased estimations (Marcoulides, Chin, & Saunders, 2009). Also, PLS is limited in terms of theory testing and comparing alternative models, and it has a nonparametric, prediction-oriented approach (Hair, Sarstedt, Ringle, & Mena, 2012). Hence, the data are analyzed using seemingly unrelated regression (SUR). SUR is an econometric analysis method that has an elaborate covariance structure (Greene, 2003, p. 374), which allows for simultaneously running a system of regression equations. The technique accounts for correlated error terms across the variables (Autry & Golicic, 2010). Zellner (1962) introduced this method as an efficient estimation of generalized least-squares models, where the variables that are independent in one equation can be dependent variables in another equation in the system (Autry & Golicic, 2010). A standard ordinary least squares (OLS) model is inefficient due

to a possible correlation of the error terms. As SUR has the power to account for contemporaneous cross-equation error correlations, it has advantages over other approaches such as path modeling. It has been shown to be an appropriate methodology when multiple equations are simultaneously tested and when there is a chance that variables in the models are related to each other (Autry & Golobic, 2010; Devaraj, Hollingwood, & Schroeder, 2004).

Autry, Grawe, Daugherty, and Richey (2010) report that SUR is an effective method for estimating models depicting mediating and/or moderating conditions using cross-sectional data. This technique is also known to alleviate endogeneity concerns (Autry & Golobic, 2010), because possible correlation between error terms are accounted for and the focal variables can be modeled as both independent and dependent within the model (Greene, 2003, p. 340). SUR models can be used to estimate time-series data as well because vector autoregression is an SUR in principle, and it accounts for linear interdependencies in time-series data (Greene, 2003, p. 588). Hence, because the SUR methodology enables transition from various theoretical optimization models to empirical models seamlessly for both cross-sectional and time-series data, it has gained popularity in fields such as economics, finance, and management (Greene, 2003, p. 373).

SUR models assume that the error terms are homoscedastic. We tested for the assumption of errors with constant variance (homoscedasticity) via the Breusch–Pagan test (Kutner, Nachtsheim, Neter, & Li, 2005, p. 118). The result of this test indicated that the error variances are not constant. Cameron and Trivedi (2009, p. 160) propose that bootstrapping can be used in conjunction with SUR when the error terms are heteroscedastic. This method allows us to get robust standard errors, and in the case that the error terms are homoscedastic, the results converge to the default standard errors (Cameron & Trivedi, 2009). We used this methodology for estimation by using the default bootstrap option. We include a control variable in our analyses to clearly discern the relationships hypothesized in the study. The history of an organization reflects a unique bundle of critical resources as well as organizational skills and capabilities that have been accumulated over time. These resources influence an organization's strategies of growth and organizational structure (Nelson & Winter, 1982). Soo, Tian, Teo, and Cordery (2017) state that “older organizations may have better developed organizational structures and systems that facilitate the effective acquisition and exploitation of knowledge” (p. 441). We expect that the longer the history of the organization, the greater the organization's embeddedness in its environment (Yiu, Bruton, & Lu, 2005). Moreover, older organizations would be more experienced with food bank operations (Lukas, Hult, & Ferrell, 1996) and they might be able to accumulate higher levels of social capital and achieve SCI relative to newer organizations. Accordingly, we control for the “age of the food bank” in our study. We present the results in the next section.

RESULTS

SUR and Mediation Analyses

The descriptive statistics of the variables used in this study are presented in Table 6.

Table 6: Descriptive statistics.

	Mean	SD	Social Capital	Organizational Capital	Human Capital	Internal Integration	Demand Integration	Supply Integration	Age
Social Capital	5.544	0.820	1						
Organizational Capital	5.116	1.070	0.392**	1					
Human Capital	5.598	0.757	0.652**	0.487**	1				
Internal Integration	5.570	0.906	0.547**	0.386**	0.397**	1			
Demand Integration	5.718	0.914	0.289**	0.300**	0.207*	0.562**	1		
Supply Integration	5.356	0.919	0.436**	0.361**	0.384**	0.555**	0.493**	1	
Age	29.709	6.259	0.023	0.065	0.093	-0.092	-0.065	-0.101	1

Note: * $p < .05$, ** $p < .01$.

Table 7: Seemingly unrelated regression results.

	Observed Coefficient	Bootstrap Std. Err.	z	$P > z $	[95% Conf. Interval]	
Dependent Variable: Social Capital						
Human Capital	0.603	0.095	6.360	0.000	0.417	0.789
Organizational Capital	0.120	0.101	1.190	0.234	−0.077	0.317
Age	−0.041	0.062	−0.660	0.507	−0.163	0.080
Dependent Variable: Supply Integration						
Social Capital	0.523	0.089	5.890	0.000	0.349	0.697
Age	−0.113	0.071	−1.580	0.115	−0.253	0.028
Dependent Variable: Demand Integration						
Social Capital	0.324	0.134	2.410	0.016	0.061	0.587
Age	−0.072	0.074	−0.970	0.330	−0.217	0.073
Dependent Variable: Internal Integration						
Social Capital	0.596	0.096	6.210	0.000	0.408	0.784
Age	−0.106	0.066	−1.600	0.109	−0.236	0.024

n = 110, control variable: Age of the Food Bank.

Based on the results of SUR, *Human Capital* turns out to be a significant predictor of *Social Capital* in food banks, lending support for H1 ($\beta = 0.603$; $p < .01$). However, when we examine the *Organizational Capital* – *Social Capital* link ($\beta = 0.120$; $p > .10$), we do not find support for H2. Hence, it appears that in the context of food banks, *Human Capital* is more crucial in building *Social Capital* than *Organizational Capital*.

Social Capital is a significant precedent of *Supply Integration* as hypothesized in H3 ($\beta = 0.523$; $p < 0.01$), which emphasizes the importance of having the social interactions and the network between the employees of the organization to build relationships that go beyond daily transactions with supplier integration. Also, *Demand Integration* is influenced by *Social Capital*, so we find support for H4 as well ($\beta = 0.324$; $p < .05$). In general, we find empirical evidence for the precedent role of the emergent connections and communications that reside in the organization on the relationships that occur in the external environment of the food bank, both upstream and downstream in the supply chain. The suppliers, agencies as well as the individuals that are connected to food banks are integrated with the organization through the social capital of the particular food bank. *Internal Integration* is driven by *Social Capital* as well, lending support for H5 ($\beta = 0.596$; $p < .01$). Therefore, the importance of skill level of employees with respect to information sharing, problem solving, and relationship development as means of building team work, interfunctional communication, understanding common metrics, and prioritization of operations is confirmed empirically. We did not find support regarding the “Age” variable’s effect on the dependent variables utilized in our study. The results of this analysis are presented in Table 7.

We conducted a series of mediation analyses to test the hypotheses regarding the role of *Social Capital* in this humanitarian context. Specifically, we first run a regression with the independent variable as a predictor of the dependent variable

to see if there is a significant relationship between the dependent variable and independent variable before testing for the mediation effect. Next, we run an SUR that includes an equation, where the independent variable predicts the mediator, and another equation, where the mediator and the independent variable predict the dependent variable at the same time. Finally, the coefficients from these equations are utilized to formally test for the significance of the indirect effect using Monte Carlo simulation (Selig & Preacher, 2008). If the indirect effect is significantly different than zero, we conclude a mediation effect. The mediation analysis findings are presented in Table 8.

The results indicate that Social Capital mediates the relationships between *Human Capital* and *Supply Integration* ($\beta = 0.206$; $p < .05$), and between *Human Capital* and *Internal Integration* ($\beta = 0.322$; $p < .01$). There was not sufficient evidence for the mediating role of *Social Capital* in the relationship between *Human Capital* and *Demand Integration* ($\beta = 0.171$; $p > .10$). This lends partial support for H6.

The results show that *Social Capital* mediates the relationships between *Organizational Capital* and *Supply Integration* ($\beta = 0.136$; $p < .01$), and between *Organizational Capital* and *Internal Integration* ($\beta = 0.183$; $p < .01$). However, there is lack of empirical support for the mediation role of *Social Capital* for the relationship between *Organizational Capital* and *Demand Integration* ($\beta = 0.079$; $p > .10$). Therefore, we have partial support for H7.

DISCUSSION

In this study, we have examined how SCI develops in the not-for-profit food bank sector. IC has been conceptualized as the antecedent of integration in food banks. To the best of our knowledge, this is the first study that examines this particular relationship and considers IC in its totality as the antecedent of SCI. We investigate the relationships between all the IC dimensions, along with their antecedent role for SCI that takes place in food banks with the help of survey responses from food bank executives. We add to the understanding of the IC–SCI relationship by proposing the dimension of social capital as an enabler for achieving SCI in humanitarian organizations. The results of our study lend support for most of our hypothesized relationships and sheds light on an important but relatively new context for business research. While humanitarian organizations have been using some of the best practices developed in for-profit contexts, they also often serve as incubators for new ideas and approaches to process management and improvement due to the necessities presented by severely resource-constrained environments. Thus, our findings present important theoretical and managerial implications that we discuss next.

The results show that IC is closely linked with the SCI practices in humanitarian organizations. Hence, if IC is not properly accounted for and understood, a misallocation of intellectual resources and a risk of making poorly informed decisions may ensue. These, in turn, lead to unproductive strategic planning, high employee turnover rates, ineffective training and development, unsuccessful top management teams, and perhaps most importantly, the inability to turn data into information in nonprofit organizations (Kong, 2008). As previously emphasized,

Table 8: Mediation results.

Mediation of Social Capital between Human Capital and Supply Integration				
	Parameter	Coefficient Estimate	Standard Error	95% Confidence Interval
c_1 :	Human Capital \rightarrow Supply Integration	0.384	0.089	[0.208, 0.560]
a_1 :	Human Capital \rightarrow Social Capital	0.652	0.081	[0.494, 0.810]
b_1 :	Social Capital \rightarrow Supply Integration	0.315	0.134	[0.053, 0.578]
a_1b_1 :	Human Capital \rightarrow Social Capital \rightarrow Supply Integration	0.206	0.093 ^c	[0.036, 0.396] ^b
c_1' :	Human Capital (with Social Capital) \rightarrow Supply Integration	0.190	0.119	[-0.042, 0.422]
Mediation of Social Capital between Human Capital and Demand Integration				
c_2 :	Human Capital \rightarrow Demand Integration	0.207	0.094	[0.020, 0.394]
a_2 :	Human Capital \rightarrow Social Capital	0.652	0.084	[0.488, 0.816]
b_2 :	Social Capital \rightarrow Demand Integration	0.263	0.150	[-0.032, 0.558]
a_2b_2 :	Human Capital \rightarrow Social Capital \rightarrow Demand Integration	0.171	0.106	[-0.016, 0.374] ^b
c_2' :	Human Capital (with Social Capital) \rightarrow Demand Integration	0.043	0.118	[-0.189, 0.274]
Mediation of Social Capital between Human Capital and Internal Integration				
c_3 :	Human Capital \rightarrow Internal Integration	0.397	0.088	[0.222, 0.572]
a_3 :	Human Capital \rightarrow Social Capital	0.652	0.080	[0.495, 0.809]
b_3 :	Social Capital \rightarrow Internal Integration	0.493	0.115	[0.268, 0.718]
a_3b_3 :	Human Capital \rightarrow Social Capital \rightarrow Internal Integration	0.322	0.091 ^c	[0.164, 0.502] ^b
c_3' :	Human Capital (with Social Capital) \rightarrow Internal Integration	0.086	0.108	[-0.126, 0.298]

Continued

Table 8: Continued

Mediation of Social Capital between Organizational Capital and Supply Integration				
c ₄ :	Organizational Capital → Supply Integration	0.361	0.090	[0.183, 0.538]
a ₄ :	Organizational Capital → Social Capital	0.392	0.110	[0.176, 0.609]
b ₄ :	Social Capital → Supply Integration	0.348	0.098	[0.155, 0.541]
a ₄ b ₄ :	Organizational Capital → Social Capital → Supply Integration	0.136	0.053 ^c	[0.043, 0.260] ^b
c ₄ ':	Org. Capital (with Social Capital) → Supply Integration	0.232	0.085	[0.066, 0.399]
Mediation of Social Capital between Organizational Capital and Demand Integration				
c ₅ :	Organizational Capital → Demand Integration	0.299	0.092	[0.117, 0.481]
a ₅ :	Organizational Capital → Social Capital	0.392	0.113	[0.172, 0.613]
b ₅ :	Social Capital → Demand Integration	0.203	0.135	[-0.061, 0.466]
a ₅ b ₅ :	Organizational Capital → Social Capital → Demand Integration	0.079	0.058 ^c	[-0.023, 0.216] ^b
c ₅ ':	Org. Capital (with Social Capital) → Demand Integration	0.225	0.082	[0.065, 0.385]
Mediation of Social Capital between Organizational Capital and Internal Integration				
c ₆ :	Organizational Capital → Internal Integration	0.386	0.089	[0.210, 0.562]
a ₆ :	Organizational Capital → Social Capital	0.392	0.112	[0.172, 0.612]
b ₆ :	Social Capital → Internal Integration	0.467	0.117	[0.238, 0.696]
a ₆ b ₆ :	Organizational Capital → Social Capital → Internal Integration	0.183	0.066 ^c	[0.064, 0.341] ^b
c ₆ ':	Org. Capital (with Social Capital) → Internal Integration	0.210	0.130	[-0.045, 0.466]

^aParameter estimates are the results of Seemingly Unrelated Regression procedure; based on 5,000 bootstrap samples.

^bConfidence Interval for the indirect effect (a₁b₁) was found by Monte Carlo simulation.

^cPoint estimate of the indirect effect is a₁b₁ = a₁*b₁; standard error of the indirect effect is calculated as $S_{ab} = \sqrt{a^2 S_b^2 + b^2 S_a^2}$

n = 110.

Control variable: Age of the Food Bank (N.S. at 0.05).

the correct utilization of existing resources is extremely important in humanitarian setting. The preparedness of humanitarian operations has five building blocks: human resources, KM, logistics, financial resources, and community (Tomasini & Van Wassenhove, 2009, p. 55). Correct deployment of IC goes hand in hand with preparedness as it relates to at least two of these building blocks: human resources and KM.

Our study sheds light on the mechanism through which *Social Capital* is built in a humanitarian aid setting. The findings from SUR and mediation analyses indicate that *Human Capital* and *Organizational Capital* precede *Social Capital*, which, in turn, helps in building SCI in food banks. Since *Social Capital* channels the impact of *Human Capital* and *Organizational Capital* on SCI, it suggests that the quality of relationships shaped by the *Social Capital* plays a critical role in attaining SCI in food banks. Prior studies have reported that relational embeddedness, which is a part of *Social Capital*, is especially instrumental in terms of process innovation (Moran, 2005). We show that achieving strategic collaborative relationships in humanitarian supply chains is driven by the interplay among the dimensions of IC. This is one of the significant theoretical contributions of our study. We show that *Human Capital* and *Organizational Capital* play a foundational role in developing *Social Capital*. The *Social Capital* thus formed, in turn, determines the way SCI is driven. Specifically, *Social Capital* acts as a mediator between *Human Capital* and *Supply Integration*, and between *Human Capital* and *Internal Integration*. Moreover, we also observe a mediating role of *Social Capital* between *Organizational Capital* and *Supply Integration*, and between *Organizational Capital* and *Internal Integration*. Systematic lack of support of the mediation of the relationship between *Human Capital* and *Demand Integration*, and between *Organizational Capital* and *Demand Integration* by *Social Capital* is interesting and is worth investigating in future research. It seems that upstream and internal SCI is achieved via *Social Capital* facilitating *Human Capital* and *Organizational Capital*; however, we do not observe the same facilitating influence of *Social Capital* in the downstream. There are studies that investigate supply integration or buyer–supplier relationships and *Social Capital* in the literature (Lawson, Tyler, & Cousins, 2008; Villena, Revilla, & Choi, 2011). However, the relationship between demand integration and *Social Capital* has not been studied as much and it could shed light on the lack of significance for the mediating role of *Social Capital*.

Age of the food bank did not turn out to be a significant variable in our model. While one might suspect the history of the organization to play a significant role in terms of establishing SCI, a lack of significance (Terjesen, Patel, & Sanders, 2012) or a negative relationship between age and SCI (Villena, Gomez-Mejia, & Revilla, 2009) has been observed in the literature before. Villena et al. (2009) state that traditional organizations might not be willing to engage in joint decision making, which is a common indicator of integration with supply chain partners, due to their inertia and resistance to change. In our case, we observe no significant relationship between SCI and age. Therefore, we can say that in the nonprofit sector, determinants of supply chain dynamics might be different than the amount of time the organization has been in existence.

In general, our study presents valuable insights for the management of food banks. First, given that IC precedes and acts as an antecedent to SCI, food banks

should be proactive in managing their *Human*, *Organizational*, and *Social Capital*. *Human Capital* is especially instrumental in building *Social Capital*. Our findings show that *Social Capital* is influenced more by the skilled workforce as compared to codified knowledge repository and information exchange mechanisms. Hence, food bank managers should give emphasis to enhancing the skill levels of their workforce, perhaps with training programs and workshops that focus on continuous improvement. Our results support the argument that good information does not translate into productive coordination unless knowledge facilitates the use of these resources effectively and contributes to collaboration (Tomasini & Van Wassenhove, 2009, p. 117). Further, information is transformed into knowledge when it is combined with know-how and expertise of the staff. This knowledge helps in making informed decisions and also promotes collaboration by improving alignment between parties involved in decision-making (Tomasini & Van Wassenhove, 2009, p. 120). Hunger issue needs to be addressed urgently and on a continuous basis, and the food bank staff has to work under various financial and time constraints to find creative solutions to deliver food. Food banks, like other humanitarian organizations, need to be agile and adaptable (Tomasini & Van Wassenhove, 2009, p. 134) so as to handle the operational issues they face. In this respect, the intellectual structure of the organization is instrumental in achieving the required responsiveness by appropriately shaping the supply chain management practices.

As *Social Capital* is a crucial aspect of IC and influences all dimensions of SCI, it should be given particular attention in food banks. Our preanalysis interviews with the food bank executives indicated that they are quite cognizant of the criticality of human assets in their business. We show that while this recognition of the importance of *Human Capital* is good, executives in charge of strategic decisions in the food-banking sector should prioritize development of *Social Capital* to enhance their internal and external integration initiatives. The results of our study show that *Social Capital* provides the pathway for obtaining the SCI benefits resulting from both *Human Capital* and *Organizational Capital*.

Social Capital is the sum of all resources, existing and potential, residing in and available through the network of relationships of members of a group. *Social Capital* encourages cooperative behavior and promotes value creation through development of new forms of association and innovative methods (Nahapiet & Ghoshal, 1998). We find support for the facilitating role of this important dimension of IC in a humanitarian aid setting. Food banks are social enterprises that require practical solutions, dynamism, and agility to operate and survive. *Social Capital* provides access to broader sources of information that is relevant, timely, and of high quality (Adler & Kwon, 2002). The knowledge, capabilities, and skills of the actors (*Human Capital*) and the knowledge engrained in structures, systems, and processes (*Organizational Capital*) are transformed into practices that support integrated supply chains through the network of interrelationships (*Social Capital*). *Social Capital* makes exchange of knowledge possible both within the organization and across boundaries with external partners because the actors identify themselves with a community and commit to collective goals and shared targets. In sum, we consider IC as a structural characteristic that drives managerial practices (SCI) in the organization. As food banks deal with extensive uncertainty in terms of supply

base, inconsistency and lack of standards in donations, variety of partners, and matching supply to demand, these organizations can and do benefit from strategic supply chain management practices (Chen & Paulraj, 2004). We propose an IC framework to analyze a potential driver for SCI in this type of resource-constrained nonprofit organizations. Managers of food banks should spend effort in recruiting and maintaining talent and relationships for the survival of their organizations as our analysis provides empirical support for the influence of the human factor in the nonprofit organization and emphasizes the social aspect of operations in this setting.

There are a few limitations of this study worth noting. First, we rely on perceptual measures to operationalize the constructs of interest. As IC and SCI are inherently latent in nature, we believe that perceptual measures are justified. Nonetheless, future studies could consider alternative measures (potentially, objective measures) to examine the set of relationships considered in this article. As discussed previously, operationalization of variables of interest in not-for-profit organizations is idiosyncratic and more difficult than in for-profit organizations. Second, since the total number of food banks under Feeding America umbrella (the sampling frame for this study) is limited (202), even though the response rate is high (54.5%), the final sample constitutes 110 responses. This constrained us from running a full-scale structural equations model for the entire conceptual framework. We had to average the scales to operationalize the constructs as against modeling the variables as latent constructs. While it is unlikely that a larger sample size can be obtained from the food bank industry, an SEM-based analysis with a larger sample size from another humanitarian aid context presents an area of future research opportunity. Also, future studies can consider certain aspects pertaining to managerial attitude and behavior to further enhance our understanding of the human factor in disaster relief operations. Finally, the relationships among the IC dimensions examined in this study could be considered in commercial settings and an empirical test can be conducted to see whether the same relationships hold in other contexts.

REFERENCES

- Adler, P. S., & Kwon, S. W. (2002). Social capital: Prospects for a new concept. *Academy of Management Review*, 27(1), 17–40.
- Akingbola, K. (2006). Strategic choice and change in non-profit organizations. *Strategic Change*, 15(6), 265–281.
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423.
- Armstrong, J. S., & Overton, T. S. (1977). Estimating non-response bias in mail surveys. *Journal of Marketing Research*, 16, 396–402.
- Arrindell, W. A., & Van der Ende, J. (1985). An empirical test of the utility of the observations-to-variables ratio in factor and components analysis. *Applied Psychological Measurement*, 9(2), 165–178.

- Ataseven, C., & Nair, A. (2017). Assessment of supply chain integration and performance relationships: A meta-analytic investigation of the literature. *International Journal of Production Economics*, 185, 252–265.
- Autry, C. W., & Golicic, S. L. (2010). Evaluating buyer–supplier relationship–performance spirals: A longitudinal study. *Journal of Operations Management*, 28(2), 87–100.
- Autry, C. W., Grawe, S. J., Daugherty, P. J., & Richey, R. G. (2010). The effects of technological turbulence and breadth on supply chain technology acceptance and adoption. *Journal of Operations Management*, 28(6), 522–536.
- Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations*, 61(8), 1139–1160.
- Bollen, K. (1989). *Structural equations with latent variables*. New York, NY: Wiley.
- Bontis, N. (2001). Assessing knowledge assets: A review of the models used to measure intellectual capital. *International Journal of Management Reviews*, 3(1), 41–60.
- Braunscheidel, M. J., & Suresh, N. C. (2009). The organizational antecedents of a firm's supply chain agility for risk mitigation and response. *Journal of Operations Management*, 27(2), 119–140.
- Cameron, A. C. & Trivedi, P. K. (2009). *Microeconometrics using Stata*. College Station, TX: Stata Press.
- Chakravarthy, B., McEvily, S., Doz, Y., & Rau, D. (2003). Knowledge management and competitive advantage. In M. Easterby-Smith & M. A. Lyles (Eds.), *The Blackwell handbook of organizational learning and knowledge management*. Malden, MA: Blackwell Publishing, 305–323.
- Chen, I. J., & Paulraj, A. (2004). Understanding supply chain management: Critical research and a theoretical framework. *International Journal of Production Research*, 42(1), 131–163.
- Chen, I. J., Paulraj, A., & Lado, A. A. (2004). Strategic purchasing, supply management, and firm performance. *Journal of Operations Management*, 22(5), 505–523.
- Das, A. J., Narasimhan, R., & Talluri, S. (2006). Supplier integration - Finding an optimal configuration. *Journal of Operations Management*, 24(5), 563–582.
- Devaraj, S., Hollingwood, D., & Schroeder, G. R. (2004). Generic manufacturing strategies and plant performance. *Journal of Operations Management*, 22(3), 313–333.
- Dierickx, I., & Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. *Management Science*, 35(12), 1504–1511.
- Drucker, P. E. (1989). What businesses can learn from nonprofits? *Harvard Business Review*, 67, 88–93.
- Eisenhardt, K. M., & Santos, F. M. (2002). Knowledge-based view: A new theory of strategy? In A. Pettigrew, H. Thomas, & R. Whittington (Eds.), *Handbook of strategy and management*. London, UK: Sage, 139–164.

- Flynn, B. B., Huo, B., & Zhao, X. (2010). The impact of supply chain integration on performance: A contingency and configuration approach. *Journal of Operations Management*, 28(1), 58–71.
- Frohlich, M. T., & Westbrook, R. (2001). Arcs of integration: An international study of supply chain strategies. *Journal of Operations Management*, 19(2), 185–200.
- Gooderham, P. N., Minbaeva, D. B., & Pedersen, T. (2011). Governance mechanisms for the promotion of social capital for knowledge transfer in multinational corporations. *Journal of Management Studies*, 48(1) 123–150
- Greene, W. (2003). *Econometric analysis*. NJ: Prentice Hall.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). Upper Saddle River, NJ: Prentice Hall.
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, 40(3), 414–433.
- Hansen, M. T., Nohria, N. & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review*, 77, 106–116.
- Holguin-Veras, J., Jaller, M., Van Wassenhove, L. N., Perez, N., & Wachtendorf, T. (2012). On the unique features of post-disaster humanitarian logistics. *Journal of Operations Management*, 30(7), 494–506.
- Hsu, I., & Sabherwal, R. (2012). Relationship between intellectual capital and knowledge management: An empirical investigation. *Decision Sciences*, 43(3), 489–524.
- Janz, B. D., & Prasarnphanich, P. (2003). Understanding the antecedents of effective knowledge management: The importance of a knowledge-centered culture. *Decision Sciences*, 34(2), 351–384.
- Kang, S. C., & Snell, S. A. (2009). Intellectual capital architectures and ambidextrous learning: A framework for human resource management. *Journal of Management Studies*, 46(1), 65–92.
- Kong, E. (2007). The strategic importance of intellectual capital in the non-profit sector. *Journal of Intellectual Capital*, 8(4), 721–731.
- Kong, E. (2008). The development of strategic management in the non-profit context: Intellectual capital in social service non-profit organizations. *International Journal of Management Reviews*, 10(3), 281–299.
- Koufteros, X., Vonderembse, M., & Jayaram, J. (2005). Internal and external integration for product development: The contingency effects of uncertainty, equivocality, and platform strategy. *Decision Sciences*, 36(1), 97–133.
- Kovacs, G., & Spens, K. (2011). Trends and developments in humanitarian logistics – A gap analysis. *International Journal of Physical Distribution and Logistics Management*, 41(1), 32–45.
- Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2005). *Applied linear statistical models*. NY: McGraw-Hill.

- Lawson, B., Tyler, B. B., & Cousins, P. D. (2008). Antecedents and consequences of social capital on buyer performance improvement. *Journal of Operations Management*, 26(3), 446–460.
- Leana, C. R., & Van Buren, H. J. (1999). Organizational social capital and employment practices. *Academy of Management Review*, 24(3), 538–555.
- Leuschner, R., Rogers, D. S., & Charvet, F. F. (2013). A meta-analysis of supply chain integration and firm performance. *Journal of Supply Chain Management*, 49(2), 34–57.
- Lukas, B. A., Hult, G. T. M., & Ferrell, O. C. (1996). A theoretical perspective of the antecedents and consequences of organizational learning in marketing channels. *Journal of Business Research*, 36(3), 233–244.
- Mackelprang, A. W., Robinson, J. L., Bernardes, E., & Webb, G. S. (2014). The relationship between strategic supply chain integration and performance: A meta-analytic evaluation and implications for supply chain management research. *Journal of Business Logistics*, 35(1), 71–96.
- Malhotra, M., & Grover, V. (1998). An assessment of survey research in POM: From constructs to theory. *Journal of Operations Management*, 16(4), 407–425.
- Marcoulides, G. A., Chin, W. W., & Saunders, C. (2009). A critical look at partial least squares modeling. *MIS Quarterly*, 33(1), 171–175.
- Menor, L. J., Kristal, M. M., & Rosenzweig, E. D. (2007). Examining the influence of operational intellectual capital on capabilities and performance. *Manufacturing and Service Operations Management*, 9(4), 559–578.
- Moran, P. (2005). Structural vs. relational embeddedness: Social capital and managerial performance. *Strategic Management Journal*, 26(12), 1129–1151.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242–266.
- Nelson, R. R., & Winter, S. G. (1982). *An evolutionary theory of economic change*. Cambridge: Belknap Press/Harvard University Press.
- Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications*. CA: Sage.
- Nunnally, J. C. (1978). *Psychometric theory*. NY: McGraw-Hill.
- O’Leary-Kelly, S. W., & Vokurka, R. J. (1998). The empirical assessment of construct validity. *Journal of Operations Management*, 16(4), 387–405.
- Podsakoff, P. M., MacKenzie S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903.
- Reed, K. K., Lubatkin, M., & Srinivasan, N. (2006). Proposing and testing an intellectual capital based view of the firm. *Journal of Management Studies*, 43(4), 867–893.
- Schoenherr, T., & Swink, M. (2012). Revisiting the arcs of integration: Cross-validations and extensions. *Journal of Operations Management*, 30(1), 99–115.

- Selig, J. P., & Preacher, K. J. (2008). *Monte Carlo method for assessing mediation: An interactive tool for creating confidence intervals for indirect effects* [Computer software].
- Sharma, S., Mukherjee, S., Kumar, A., & Dillon, W. R. (2005). A simulation study to investigate the use of cutoff values for assessing model fit in covariance structure models. *Journal of Business Research*, 58(7), 935–943.
- Soo, C., Tian, A. W., Teo, S. T., & Cordery, J. (2017). Intellectual capital–enhancing HR, absorptive capacity, and innovation. *Human Resource Management*, 56(3), 431–454.
- Subramaniam, M., & Youndt, M. A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy Management Journal*, 48(3), 450–463.
- Swink, M., Narasimhan, R., & Wang, C. (2007). Managing beyond the factory walls: Effects of four types of strategic integration on manufacturing plant performance. *Journal of Operations Management*, 25(1), 148–164.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
- Terjesen, S., Patel, P. C., & Sanders, N. R. (2012). Managing differentiation–integration duality in supply chain integration. *Decision Sciences*, 43(2), 303–339.
- Tomasini, R. M., & Van Wassenhove, L. N. (2009). *Humanitarian logistics*. London, UK: Palgrave Macmillan.
- Van Wassenhove, L. N. (2006). Humanitarian aid logistics: Supply chain management in high gear. *Journal of Operational Research Society*, 57(5), 475–489.
- Villena, V. H., Gomez-Mejia, L. R., & Revilla, E. (2009). The decision of the supply chain executive to support or impede supply chain integration: A multidisciplinary behavioral agency perspective. *Decision Sciences*, 40(4), 635–665.
- Villena, V. H., Revilla, E., & Choi, T. Y. (2011). The dark side of buyer–supplier relationships: A social capital perspective. *Journal of Operations Management*, 29(6), 561–576.
- Walters, S. (2010). *From pantry to food bank: The first forty years – A history of the food bank of Yolo County*. Bloomington, IN: Author House Publishing.
- Wright, P. M., & McMahan, G. C. (1992). Theoretical perspectives for strategic human resource management. *Journal of Management*, 18(2), 295–320.
- Yiu, D., Bruton, G. D., & Lu, Y. (2005). Understanding business group performance in an emerging economy: Acquiring resources and capabilities in order to prosper. *Journal of Management Studies*, 42(1), 183–206.
- Youndt, M. A., Subramaniam, M., & Snell, S. A. (2004). Intellectual capital profiles: An examination of investments and returns. *Journal of Management Studies*, 41(2), 335–362.
- Zellner, A. (1962). An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. *Journal of the American Statistical Association*, 57(298), 348–368.

APPENDIX

Construct	Measurement Items	Reference
Internal Integration	<ol style="list-style-type: none"> (1) Functional teams are aware of each other's responsibilities. (2) Functional teams have a common prioritization of clients in case of supply shortages and how allocations will be made. (3) Supply decisions are based on plans agreed upon by all functional teams. (4) All functional teams use common metrics of performance while coming up with supply chain operations plans. (5) Operational and tactical information is regularly exchanged between functional teams. (6) Performance metrics promote rational trade-offs among customer service and operational costs. 	Schoenherr and Swink (2012), Koufteros et al. (2005), Swink et al. (2007)
Demand Integration	<ol style="list-style-type: none"> (1) We pursue client relationships and involvement that go beyond service transactions. (2) Our plans address individual client requirements. (3) We have clearly defined roles and responsibilities for managing client relationships. (4) We are constantly exploring new ways of utilizing client input in our operations. (5) We synchronize our internal activities so that we can serve to clients in need in a timely fashion. 	Schoenherr and Swink (2012), Koufteros et al. (2005), Swink et al. (2007)

Construct	Measurement Items	Reference
Supply Integration	<ol style="list-style-type: none"> (1) We pursue supplier relationships and involvement that go beyond daily operational transactions. (2) Our plans address individual suppliers' capabilities. (3) We synchronize our activities with those of key suppliers. (4) We exchange operational information with suppliers on a regular basis. (5) We occasionally exchange operational information with suppliers. (6) We are constantly exploring new working relationships with suppliers. 	Schoenherr and Swink (2012), Koufteros et al. (2005), Swink et al. (2007)
Human Capital	<ol style="list-style-type: none"> (1) Our employees are highly skilled. (2) Our employees are widely considered among the best trained and educated in their particular fields. (3) Our employees are creative and bright. (4) Our employees are experts in their particular jobs and functions. (5) Our employees develop new ideas and knowledge. 	Subramaniam and Youndt (2005)
Social Capital	<ol style="list-style-type: none"> (1) Our employees are skilled at collaborating with each other to diagnose and solve problems. (2) Our employees share information and learn from one another. (3) Our employees interact and exchange ideas with people from different areas of the food bank. 	Subramaniam and Youndt (2005)

Construct	Measurement Items	Reference
	(4) Our employees partner with clients, suppliers, agencies, etc., to develop solutions.	
	(5) Our employees apply knowledge from one area of the food bank to problems and opportunities that arise in another.	
Organizational Capital	(1) Much of our food bank's knowledge is contained in manuals, databases, etc. (2) Our food bank's culture (stories, rituals) contains valuable ideas, ways of doing business, etc. (3) Our food bank embeds much of its knowledge and information in structures, systems, and processes. (4) Our food bank strictly keeps detailed documentation of the operations to preserve the knowledge.	Subramaniam and Youndt (2005)

Note: Seven-point Likert scale was used to measure the constructs.

Cigdem Ataseven is an assistant professor in the Department of Operations and Supply Chain Management at Cleveland State University, Cleveland, OH, USA. She received her BS degree in management and her MS degree in decision science and operations management from Bilkent University, Ankara, Turkey. She completed her PhD in production and operations management at the University of South Carolina, Columbia, SC, USA. Her research interests include operations strategy, supply chain management, humanitarian operations, operations-marketing interface, and innovation and technology management. Her work has been published in peer-reviewed journals and presented at national and international conferences.

Anand Nair is a professor in the Department of Supply Chain Management at the Eli Broad College of Business, Michigan State University. As a part of his research, he examines the ways in which manufacturing and service firms can manage complexity, risk, and relationships inherent in operational, supply chain, and innovation activities so as to improve cost, quality, delivery, flexibility, innovation, and sustainability performance. He investigates how manufacturing and service firms can manage supply and innovation networks by strengthening end-to-end visibility and fostering adaptive strategic and operational behaviors. His research and teaching endeavors also consider how manufacturing and service

firms can effectively manage their capacity and inventories, and create appropriate relationships with supply and distribution partners so as to reduce cost and improve customer service. His research articles have been published in leading operations and supply chain management journals. Anand teaches operations and supply chain management to MBA, undergraduate, and doctoral students. He holds the *Certified Fellow in Production and Inventory Management* (CFPIM) designation from APICS and the *Certified Quality Engineer* (CQE) designation from ASQ. He serves on the editorial boards of various journals and is currently serving as department editor for the *Journal of Operations Management* and associate editor for *Decision Sciences*.

Mark Ferguson is a Distinguished Business Foundation Fellow and professor of management science in the Darla Moore School of Business at the University of South Carolina. He received his PhD in business administration, with a concentration in operations management from Duke University in 2001. He holds a BS in mechanical engineering from Virginia Tech and an MS in industrial engineering from Georgia Tech. Dr. Ferguson's research interests involve many areas of supply chain management including supply chain design for sustainable operations, contracts that improve overall supply chain efficiency, pricing and revenue management, and the operations/marketing interface. His 2012 paper on the environmental impact of product leasing won the Best Operations Management Paper Award for papers published between 2012 and 2014 in Management Science. Another two of his papers have won best paper award from the Production and Operations Management Society (POMS), and three of his research projects have been funded by the National Science Foundation. He is the coauthor of the books *Segmentation, Revenue Management and Pricing Analytics* and *Pricing Segmentation and Analytics* and coeditor of the book *Closed Loop Supply Chains: New Developments to Improve the Sustainability of Business Practices*. He has served as the president of the INFORMS Manufacturing and Services Operations Management Society and the president of the POMS College of Supply Chain Management and the INFORMS Revenue Management and Pricing Section. Prior to joining the Moore School in 2011, he was the Steven Denning Professor of Technology and Management at the College of Management at the Georgia Institute of Technology and spent 5 years as a manufacturing engineer and inventory manager with IBM.