

SUPPLY CHAIN TRUST: A TWO-WAY STREET?

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ABSTRACT

This research compares differences between customers' and suppliers' perceptions of the trustworthiness of their supply chain exchange partners and the implications for performance, applying the organizational behavior and marketing literature on trust to the supply chain context. A survey in the logistics sector in Brazil was used to collect data from two independent samples (customers and suppliers). Three alternative models of the antecedents of trustworthiness perceptions and the relationship between trust and performance were tested using multiple regression. This was followed by a panel session with logistics industry experts to discuss the results and their practical implications. We found that the ability of an exchange partner is important to both suppliers and customers in their perceptions of trustworthiness. In addition, customer integrity is important to suppliers, while supplier benevolence is important to customers. Trust is related to expectations about order accuracy, quality and cost by both suppliers and customers and to suppliers' on-time delivery expectations. The findings support the contention of social exchange theory that, when there is a trusting relationship between exchange partners, there is heightened commitment to jointly held goals. They also support transaction cost economics theory by showing how trust forms an intangible transaction-specific asset that serves as a governance mechanism against opportunistic behavior. The findings provide a useful guideline for managers seeking to improve trust in their supply chain relationships. This paper extends interorganizational trust models showing that the relationship between trust and performance may not be applicable to customers and suppliers in the same manner.

Keywords:

Buyer-supplier relationship management; logistics; survey research

INTRODUCTION

The effective management of customer-supplier relationships is central to the success of supply chain management. Evaluating customer and supplier perceptions of trust in their relationships with each other can highlight problem areas and opportunities for performance improvement (Whipple & Frankel, 2000). While much of the prior research on supply chain trust has focused on its relationship to performance (Corsten, Gruen & Peyinghaus, 2011; Dyer, 1997; Villena, Rebillá & Choi, 2011), other questions remain to be resolved. For example, do customers evaluate whether they can trust a supplier based on the same criteria used by suppliers in assessing their trust of customers? Are customers' trust of suppliers and suppliers' trust of customers equally important to supply chain performance? Through developing a better understanding of these potential differences, managers will be better prepared to take steps to improve their organization's trustworthiness in the eyes of its customers and suppliers.

In addition, much of the prior supply chain trust research has been monadic, from the perspective of either customers or suppliers (Golicic, 2007). However, by its very nature, trust is a dyadic construct, involving both the trustor and the trustee. Thus, while helping to articulate key constructs, much of the prior supply chain trust research is prone to respondent bias because it uses a single source to assess a dyadic construct (Flynn, Pagell & Fugate, 2018), implicitly assuming that both parties in a relationship would assess its level of trust in the same way. Ketchen et al. (2018) liken this to a marriage counselor asking only one spouse about the quality of a marriage. We seek to add to this literature by studying customers' and suppliers' independent perceptions of supply chain trust, in order to help understand differences in their perceptions. We seek to answer these questions by applying three alternative models of interpersonal trust to the context of a supply chain, studying the perceptions of both customers and suppliers. In doing so, we highlight the

trustworthiness of the parties in a relationship, which is antecedent to the development of trust. This has important implications for managers seeking to improve trust in their supply chain relationships.

We begin by establishing a theoretical background for the positive effects of trust, based on social exchange theory and the negative effects of a non-trusting relationship, based on transaction cost economics theory. These concepts are used to develop hypotheses about critical dimensions of trustworthiness, their relationship to supply chain trust and the relationship between supply chain trust and performance. Hypotheses are tested using data from a survey of customers and suppliers of logistics services in Brazil. The findings make important contributions to the literature on supply chain trust, as well as to managers of firms involved in supply chain relationships.

TRUST IN A SUPPLY CHAIN

The supply chain environment is comprised of complex, tightly coupled interfirm networks shaped by often intense global competition (Bode, et al., 2011). While subjective, trust is central in explaining supply chain relationships (Morgan & Hunt 1994). Establishment of trust can be challenging in a supply chain, however, because a trustor may have to make decisions about a relationship prior understanding whether or not the trustee will actually fill its promises (Kee & Knox, 1970; Bode, et al., 2011). The trustor may need to conduct exchanges with a supplier or customer with which it has no prior experience, thus, it may lack an experiential foundation for assessing whether a supplier will deliver items of the promised quality at the promised time or a customer should be extended credit. Yet, because of the inextricable linkages between firms in a supply chain (Flynn, et al., 2016), the trustor will need to rely on a trustee to perform important functions for it (Bode, et al., 2011).

Theoretical Foundations

The theoretical foundations of supply chain trust are provided by social exchange theory (SET) and transaction cost economics theory (TCE). SET describes business relationships as inherently interwoven with personal relationships (Zaheer & Venkatraman, 1995). This is relevant to supply chains because supply chain relationships are established between individuals, on behalf of their firms. Although contractual relationships are between firms, personal relationships often guide the selection of the firms that are parties to a contract. When there is a committed, trusting relationship between them, both are more strongly tied to jointly established goals (Chen & Paulraj, 2004), according to SET. For example, a customer will treat a trusted supplier like a team member, rather than an anonymous transactional exchange partner. As the duration and intensity of interactions between supply chain exchange partners increases, their bonds of attraction lead to development of embedded relationships that generate trust, causing behavioral expectations about the relationship (Ambrose, Marshall & Lynch, 2010; Granovetter, 1985). When transactions are embedded within a reciprocal social relationship like trust, social sanctions can function as governance mechanisms that protect the interests of customers and suppliers (Dyer & Chu, 2000). Thus, SET focuses on the positive outcomes of the normative relationship commitment (Morgan & Hunt, 1994; Wetzels, et al., 1998) that results from trust between firms.

TCE, on the other hand, focuses on avoiding the negative consequences of a non-trusting relationship, which is also important in supply chains. For example, when a supplier is required to invest in a transaction-specific asset such as a machine that can't be deployed for use with other customers, the customer may engage in opportunistic behavior, such as reducing the price that it pays or dealing with the supplier's competitors in an attempt to extract concessions. Thus, investments in transaction-specific assets create a transaction cost imbalance, which will be opportunistically exploited (Dyer, 1977; Poppo & Zenger, 2002; Zaheer & Venkatraman, 1995).

In order to prevent such hazards, trustees employ safeguarding mechanisms, such as legal contracts that can be costly to monitor compliance with.

Trust can function as an alternative safeguarding mechanism against exchange hazards, leading to reduced transactions costs (Corsten, et al., 2011; Poppo & Zenger, 2002; Zaheer & Venkatraman, 1995). The mutual expectations and understandings associated with trust serve as an intangible transaction-specific asset that can reduce the likelihood of opportunistic behavior, because its development requires a substantial amount of time (Weiss & Kurland, 1997) for both firms to learn the nuances of dealing with the other's requirements. The resulting modified procedures become embedded in employees and day-to-day routines (Simon, 1996; Zack, 1999), making them difficult to directly observe (Nielson, 1996), in order to be exploited. Further, because the trustee must engage in frequent communication with the trustor to understand its needs (Subramani & Venkatraman, 2003), the trustor has a better basis for monitoring the trustee's activities, making it more difficult for the trustee to take advantage of it. Finally, because both the trustor and trustee must invest time into developing a trusting relationship, there are also transaction costs for the trustee associated with terminating the relationship, leading to reduced opportunistic behavior.

Definition of Trust

The roots of supply chain trust lie in literature on interpersonal trust (Farris, et al., 1973; Boss, 1978) and interorganizational trust (Moorman, 1993; Gulati, 1995). We draw upon these foundations to develop a clear definition of trust between a customer and a supplier in a supply chain and its dimensions, using both the customer and supplier as the referent. Like the individual-level trust research in the organizational behavior literature, supply chain relationships have a strong non-economic component. However, because commercial relationships between firms are

inherently interwoven with personal relationships between individuals in purchasing and sales functions of the firms (Zaheer & Venkatraman, 1995), both perspectives are relevant.

In general, trust is a poorly understood construct, akin to Supreme Court Justice Potter Stewart's description of pornography:

I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description, and perhaps I could never succeed in intelligibly doing so. But I know it when I see it (Lattman, 2007).

Like pornography, people believe that they know trust when they see it, even though it may be difficult to articulate exactly what constitutes it. Thus, "trust" is a type of shorthand description with numerous connotations, some of which are conflicting. For example, the sociological perspective describes trust as a characteristic of the "social fabric" that facilitates interactions between firms (Lewis & Weigert, 1985), positioning trust as a characteristic of a relationship. The legalistic perspective focuses on control mechanisms and contractual provisions that protect a trustor from trustees' opportunistic behavior (Colquitt, Scott & LePine, 2007). The psychological perspective views trust as an individual personality characteristic; it is a trustor's generalized expectation that trustees' promises can be relied upon (Rotter, 1967). These perspectives provide an insufficient foundation for the study of trust in a supply chain. The sociological perspective, while describing relationships, doesn't provide a means for a trustee to establish itself as trustworthy (Mayer & Davis, 1999). The legalistic perspective can actually encourage opportunistic behavior by trustees in longer term relationships (Mayer, Davis & Schoorman, 1995), since a trustor's monitoring of the trustee or defensive behaviors may be interpreted by trustees as a sign of distrust (McAllister, 1995). The psychological perspective of trust propensity as an individual characteristic is important in understanding a specific trustor, but ignores the shared exchanges between firms over time (Lewis & Weigert, 1985).

The supply chain literature is rife with definitions of trust, and supply chain trust has been operationalized in numerous ways (Delbufalo, 2012; Seppänen, et al., 2007; Whipple, et al., 2013), illustrated in Table 1. Although there are multiple dimensions, there is little agreement on what they are. Different terms have been used to describe the same dimension; for instance, “credibility,” “ability” and “competence” have all been used to describe the extent to which a supplier has the required expertise to perform a job (Ganesan, 1994; Komiak & Benbasat, 2004), but “credibility” is also used synonymously with “honesty.” “Integrity” has been used to describe both the belief that a trustee tells the truth (Komiak & Benbasat, 2004), as well as a trustee’s consistency of actions (Bode, Wagner, Petersen & Ellram, 2011). Thus, there is a need for a clear, parsimonious definition of supply chain trust and its dimensions.

Insert Table 1 About Here

We build on the seminal work of Mayer, et al. (1995), who define trust as *a trustor’s willingness to be vulnerable to a trustee’s actions*. This applies well in a supply chain, where a trustor, such as Mattel or a JIT manufacturer, is vulnerable to suppliers’ actions, such as the use of lead paint to decorate toys or suppliers’ promises of on-time delivery. Thus, trust is:

The willingness of a firm to be vulnerable to the actions of another firm, based on the expectation that the other will perform a particular action that is important to the trustor, irrespective of [its] ability to monitor or control the other firm (Mayer, et al., 1995, p. 112).

There are several key aspects of this definition. It is based on the trustor’s *expectation* that a trustee will provide what is expected (Mc Allister, 1995) (safe toys or components delivered on time), rather than what is feared (toys with safety hazards or late deliveries). A trustor’s expectations are its perceptions, beliefs or confidence about a relationship (Anderson & Narus, 1990; Doney & Canon, 1997; Ganesan, 1994; Swan & Nolan, 1985), based on prior experiences with the trustee, the trustee’s reputation, recommendations by others, the trustor’s trust propensity,

contractual arrangements and a host of other dimensions (Mayer, et al., 1995). These expectations are continuously adjusted; positive outcomes lead to fulfillment of the trustor's expectations, enabling trust, while negative outcomes relative to expectations lead to reduced trust and the need for safeguards (Blau, 1965; Deutsch, 1958; Noorderhaven, 1992; Swan & Nolan, 1985).

Vulnerability implies that there is something important to the trustor at stake (Mayer, et al., 1995), such as revenue, ability to meet delivery obligations or reputation for providing safe products. Vulnerability arises when a trustor's scarce resources cause it to depend on a trustee to provide resources and activities (Bode, et al., 2011). Trust has an affective component, since actual supply chain risk can arise from many dimensions unrelated to a trustor's willingness to take a risk, such as weather, political climate, competitive factors, infrastructural factors and economic stability.

Trustworthiness

Constructs like vulnerability, expectations and risk can be difficult to operationalize, making trust a somewhat amorphous construct. Thus, the focus of this research is on the antecedents to trust in a supply chain relationship, which comprise what is known as trustworthiness. Trustworthiness is a relationship-specific characteristic of a trustee (Mayer, et al., 1995). It is the trustor's expectation that a trustee will perform a particular action (Colquitt et al., 2007). It is specific to a relationship between two firms; a specific trustor expects that a specific trustee will deliver on its promises. Trustworthiness is thus also related to a specific expected action (Mayer, et al., 1995), such as on-time delivery, production to specifications, adherence to health and safety requirements, making payments as promised or providing clear specifications. Thus, trustworthiness is not the same as trust towards a specific trustee or an individual's trust propensity (Colquitt, et al., 2007), rather, it is an antecedent to trust. This has important

implications for supply chain members since, by understanding the dimensions of its own trustworthiness, a customer or supplier can nurture trust by current or potential trustors. Thus, while trust, itself, may be a somewhat amorphous construct that can be difficult to understand, developing a better understanding of the critical dimensions of trustworthiness in a supply chain can guide a firm towards specific actions that it can take to improve the perceptions of its trustors.

Mayer et al.'s (1995) seminal research proposes three dimensions of trustworthiness that encompass many, diverse dimensions, yet vary independently. Accordingly, we build on this research to propose three dimensions of trustworthiness that provide a foundation for supply chain trust: trustees' ability, benevolence and integrity. Each contributes a unique perspective of a trustor's perception of a trustee's trustworthiness in a given situation. These three dimensions are interrelated, but separable (Mayer, et al., 1999). For example, if a supplier has superb technical skills (high ability), but routinely engages in opportunistic behavior through its pricing or sharing the customer's proprietary information with its competitors (low benevolence), the customer will not trust the supplier, manifest by its low willingness to continue to make itself vulnerable to the suppliers' opportunistic behavior, should alternative suppliers with similar ability become available. Similarly, integrity is inextricably linked to, yet independent from, ability and benevolence. For example, if a supplier that treats a customer well (high benevolence) and has a high level of technical capabilities (high ability) also has a history of circumventing safety requirements (low integrity), the customer may not be willing to continue be vulnerable to this supplier's practices. This was the painful lesson learned by Mattel after it subcontracted production in China to benevolent and capable suppliers that demonstrated low integrity by further subcontracting some of their operations to contractors that failed to adhere to Mattel's lead paint

standards (Lyles, 2008). The three dimensions of trustworthiness are described in a supply chain context below and used as the foundation for developing an initial set of hypotheses.

Ability. Ability is the set of skills, competencies and characteristics that enable a trustee to do what the trustor expects. In a supply chain, ability is a trustor's belief that a customer or supplier is knowledgeable, reliable and has the needed technical capabilities to perform the expected task effectively (Andersen & Kumar, 2006; Cho, 2006; Ganesan, 1994; Komiak & Benbasat, 2004). Ability is domain-specific (Mayer, et al., 1995). For example, a supplier may have specialized technical skills for producing a particular set of components, while it may have little aptitude for others. Perceptions of ability emerge through formal transactions or negotiations (Anderson & Weitz, 1989), Noorderhaven, 1992; Zaheer, McEvily & Perrone, 1998), or they can develop informally (Mayer & Davis, 1999), through situational norms, behaviors or intentions (Dyer & Chu, 2000; Swan & Nolan, 1985). Thus, a trustor's perception of a trustee's ability is based on both knowledge and skills related to a specific job and its interpersonal skills and general wisdom (Colquitt, et al., 2007) related to supply chain success.

Ability subsumes other related constructs including competence, expertise (Colquitt, et al., 2007), business sense, predictability and judgment (Mayer, et al., 1995). For example, predictability is the consistency with which the trustee meets expectations. However, because it does not imply directionality, predictability can actually reduce trustworthiness (Mayer, et al., 1995); for example, a supplier may predictably produce poor quality items or miss deadlines, or a customer may consistently make late payments or provide unclear specifications. Thus, ability is the broader construct based on the predictability of positive outcomes. As a dimension of trustworthiness, a trustor's perception of a trustee's ability is an antecedent to its trust. Thus,

H1: The perceived ability of a trustee is an antecedent to supply chain trust.

A supplier's ability is based on its technical capabilities for meeting a customer's specifications and available capacity to deliver on time. When selecting a new supplier, recommendations by others provide customers with assurance that the supplier will deliver needed components in a timely manner. For existing suppliers, their past performance provides customers assurance that they will continue to perform as expected. In this way, the supplier's ability provides a way of meeting the customer's expectations, causing the customer to be willing to make itself vulnerable to it.

H1a : The perceived ability of a supplier is an antecedent to a customer's trust in it.

A supplier also has expectations about its customers, trusting that they will make payments on time and accurately describe their needs. Customers' abilities are assessed through prior experience, knowledge of their cash flow situation, terms of contractual relationships or reputation. When a customer is perceived to have the appropriate level of ability, the supplier is willing to make itself vulnerable by extending credit or taking on a customer's job.

H1b : The perceived ability of a customer is an antecedent to a supplier's trust in it. Benevolence.

A trustee's benevolence is the extent to which it is perceived to be genuinely interested in the trustor's welfare and motivated to seek joint gain (Anderson & Kumar, 2006; Doney & Cannon, 1997; Ganesan, 1994). It is the extent to which a trustee is perceived as wanting to do good for the trustor, beyond its own self-interest (Mayer, et al., 1995; McAllister, 1995). In a supply chain, benevolence is manifested in a trustee's altruistic behavior towards a customer or supplier, demonstrating that it is acting in their best interests. Related constructs include the trustee's caring intentions and motives, altruism, loyalty (Mayer, et al., 1995), organizational citizenship behavior (Organ, 1988), openness, caring, receptivity, availability (Colquitt, et al.,

2007) and goodwill. As a dimension of trustworthiness, the trustee's benevolence is an antecedent to supply chain trust.

H2: The perceived benevolence of a trustee is an antecedent to supply chain trust.

A benevolent supplier may put in extraordinary effort to help a customer address a tight deadline. In negotiations, it considers the customer's needs, as well as its own.

H2a: The perceived benevolence of a supplier is an antecedent to a customer's trust in it.

Conversely, a customer may demonstrate benevolence by offering a long-term contract to a supplier, provide it with financing for the purchase of a new piece of equipment or provide specialized training that the supplier can leverage to other customers.

H2b : The perceived benevolence of a customer is an antecedent to a supplier's trust in it.

Integrity. Integrity is the trustor's perception that a trustee adheres to a set of principles that it finds acceptable (Colquitt, et al., 2007); both alignment between the trustee's and trustor's principles and the trustee's adherence to them are important (Mayer, et al., 1995). Integrity is established through the extent to which a trustee keeps promises, fulfills expectations and avoids issues that could cause problems for a trustor (Blau, 1965; Swan & Nolan, 1985; Zaheer & Venkatraman, 1995). A trustor forms perceptions of a trustee's integrity through the consistency of its past actions, communications about its actions (Bode, et al, 2011), its belief that the trustee has a strong sense of justice and fairness, and the extent to which the trustee's actions are aligned with its promises. Related constructs include value congruence (Sitkin & Roth, 1993), fairness (Butler, 1991), discretion (Colquitt, et al., 2017) and character (Gabarro, 1978). They build upon the trustor's expectation that a trustee's word can be relied upon, that it makes good faith agreements, fulfills its promises (Doney & Cannon, 1997; Thomas & Skinner 2010; Tian, Lai & Daniel, 2008), presents real facts about outsourced work, reacts proactively if something goes

wrong and shares important information (Oza, Hall, Rainer & Grey, 2006; Svensson, 2001; Tian, et al., 2008). As a dimension of trustworthiness, integrity is an antecedent to supply chain trust.

H3: The perceived integrity of a trustee is an antecedent to supply chain trust.

A supplier perceived to have integrity will establish a fair price for its services and will value the same principles as its customers do. For example, a supplier that values low cost over safety standards might not be viewed by customers as having a high level of integrity, while a supplier that refuses to compromise its quality standards would.

H3a: The perceived integrity of a supplier is an antecedent to a customer's trust in it.

Customer integrity is established by actions such as demonstrating its willingness to pay suppliers a fair price without extended negotiations and clear articulation of its values and principles to suppliers.

H3b : The perceived integrity of a customer is an antecedent to a supplier's trust in it.

Figure 1 summarizes the relationships described by these hypotheses.

Insert Figure 1 About Here

Alternative Conceptualizations of Trustworthiness

We examine two alternative configurations of trustworthiness, in order to better understand trust in a supply chain.

Competence-character model. Gabarro's (1978) longitudinal research found two dimensions of trustworthiness. The first is competence, which is conceptually synonymous with ability, as described above. The second is a multifaceted construct that Gabarro (1978) called "character," which includes honesty, openness, fairness, predictability and caring motives and intentions. The character-competence model is supported by Colquitt, et al.'s (2007) argument that it is unclear whether benevolence and integrity each have a unique effect on trust. It proposes that

benevolence and integrity have a compensatory effect, where either is sufficient for fostering trust; the absence of one can be compensated for by the presence of the other. Thus, our first alternative conceptualization of trustworthiness, illustrated in Figure 2, is based on competence (the “can-do” dimension), and character (the “will-do” dimension) (Colquitt, 2007). Because the relationship between competence (ability) and supply chain trust was already hypothesized above (H_{1a} and H_{1b}), we only propose new hypotheses related to character as a dimension of supply chain trustworthiness.

H_{4a}: The perceived character of a supplier is an antecedent to a customer’s trust in it.

H_{4b}: The perceived character of a customer is an antecedent to a supplier’s trust in it. Insert

Figure 2 About Here

Cognition-based trust and affect-based trust model. McAllister (1995) described trustworthiness as related to the trustor’s knowledge about a trustee. If a trustor has full knowledge, there is no need for trust; conversely, if a trustor is completely ignorant about the trustee, there is no rational basis for trust. McAllister (1995) described two dimensions of knowledge about a trustee. Affect-based trust is grounded in the emotional bonds between a pair of firms, the extent of genuine care and concern for the welfare of the other, belief in the intrinsic value of the relationship and the belief that these sentiments are reciprocated by the other firm (McAllister, 1995). Affect-based trust is demonstrated through the trustee’s citizenship behavior toward the trustor and the frequency of their interaction. Thus, affect-based trust is equivalent to benevolence, described above.

Cognition-based trust, which is based on the trustee’s reliability and dependability (Rempel, et al., 1985; Johnson-George & Swap, 1982), is more objective (McAllister, 1995). Antecedents of cognition-based trust include the success of past interactions and the extent of social and organizational similarity between the trustor and trustee, including formal rule specifications and

professional credentials. Thus, cognition-based trust, summarized in Figure 3, includes both ability and integrity, as described above (Colquitt, et al., 2007; Flores & Solomon, 1998; Rousseau, et al., 1998; Williams, 2001).

Insert Figure 3 About Here

A baseline of cognition-based trust is necessary before affect-based trust can develop. Without expectations about a trustee's dependability, a trustor can't be confident in making attributions about the trustee's potential citizenship behavior (the trustee must have the ability to execute, not just good intentions). Because we have already proposed hypotheses about the relationship between affect-based trust (benevolence) and trust above in H_{2a} and H_{2b}, we only propose further hypotheses about cognition-based trust as an antecedent to supply chain trust.

H_{5a}: The perceived cognition-based trust of a supplier is an antecedent to a customer's trust in it.

H_{5b}: The perceived cognition-based trust of a customer is an antecedent to a supplier's trust in it.

Relationship Between Trustworthiness and Performance

The outcomes of interpersonal and interorganizational trust range from commitment to safeguards to problems (Blau, 1965; Deutsch, 1958; Noorderhaven, 1992; Swan & Nolan, 1985). We add supply chain outcomes to the consequences of trust. Consistent with Nyaga, Whipple and Lynch (2010), we view trust as mediating the relationship between trustworthiness and performance (Dirks & Ferrin, 2001; Jones & George, 1998; Williams, 2001; Ross & LaCroix, 1996). As described by SET, trustworthiness lays the foundation for social exchange relationships (Blau, 1964) between the trustor and trustee that can be critical to performance. It also reduces the potential for opportunistic behavior by a trustee through development of intangible transaction-specific assets.

Thus, we propose that trustworthiness is positively associated with supply chain trust. The outcome of supply chain trust is the trustor's willingness to make itself vulnerable to a trustee by engaging in various types of risk taking behavior (Mayer & Davis, 1999) that can be beneficial to supply chain performance. This may include cooperation with the trustee, sharing sensitive information with the trustee and voluntarily allowing the trustee to have control over issues (such as product quality) and assets (such as equipment or dies) that are important to the trustor (Mayer & Davis, 1999). These activities, in turn, should be positively related to performance.

H6a: Trust of a customer is associated with a supplier's order accuracy expectations.

H6b: Trust of a supplier is associated with a customer's order accuracy expectations.

H7a: Trust of a customer is associated with a supplier's quality expectations.

H7b: Trust of a supplier is associated with a customer's quality expectations.

H8a: Trust of a customer is associated with a supplier's cost expectations.

H8b: Trust of a supplier is associated with a customer's cost expectations.

H9a: Trust of a customer is associated with a supplier's on-time delivery expectations.

H9b: Trust of a supplier is associated with a customer's on-time delivery expectations.

METHOD

This research was conducted in two stages. First, data was collected from customers and suppliers using a survey to test the proposed hypotheses. Second, a panel of subject matter experts was convened to discuss the findings, providing richness and contextual understanding to the results. This helped to ground the results in management practice, as well as reducing the potential for common method bias.

Sample

The sample was drawn from the logistics service industry in Brazil, which includes activities related to inventory management, storage, transportation and value-added services. Trust is especially critical in this industry, as firms outsource more and more important logistics

activities (Ambrose et al., 2010; Delbufalo, 2012; Ha, Park & Cho, 2011; Nyaga et al., 2010; Seppänen et al., 2007). One of the authors has more than 15 years of strategic, managerial and operational experience in this industry, making it possible to probe more deeply into its problems and issues. Data was collected in two independent samples, one consisting of suppliers of logistics services and the other consisting of customers of logistics services. The sample was randomly drawn from two trade association mailing lists: Abralog (Brazilian Logistics Association) and Publicare (the publisher of *Tecnológica*).

Measures

All items were measured using a 5-point perceptual Likert scale (1=Strongly Disagree, 5=Strongly Agree). *Ability* is based on Cho's (2006) competency measure. It contains four items that ask respondents to assess their perceptions of a major supplier or major customer's expertise and competency. The measure of *benevolence* was taken from Doney and Cannon's (1997) benevolence measure, for which a reliable and valid Portuguese translation exists (Frederico & Parente, 2008). It contains three items that ask respondents about the extent to which a major customer or supplier cares about their wellbeing and supports their goals. *Integrity* uses seven items from Svensson's (2001) honesty measure and Doney and Cannon's (1997) credibility measure. It asks for respondents' perceptions of a major supplier or customer's principles and fairness. It includes two reverse-coded items. Trust was measured using a single item from Doney and Cannon's (1997) credibility measure that assesses generalized trust.

Performance was measured by four single-item perceptual measures that assess the extent to which a major supplier or customer meets the respondent firm's expectations about logistics service performance. They were developed based on the commonly used measures of cost, quality, dependability and flexibility (Ambrose et al., 2010; Chow, Heaver, & Henriksson, 1994;

Conceição & Quintão, 2004; Dalstrom, McNeilly, & Speh, 1996; Flynn, Huo, & Zhao, 2010; Gassenheimer, Sterling, & Robicheaux, 1996; Nyaga et al., 2010; Schoenherr & Swink, 2012; Terpend, Tyler, Krause, & Handfield, 2008; Villena et al., 2011; Zacharia, Nix, & Lusch, 2011), adapted to the logistics services context. *Order accuracy* measures the extent to which an order was correctly processed, fulfilled and delivered in-full. *Quality* is the percent of orders delivered undamaged or in the condition that was expected. *Cost* assesses the extent to which the cost of logistics activities was consistent with expectations. *On-time delivery* is the percentage of orders delivered on the committed date.

There were two control variables. *Relationship duration* is the length of time of the exchange relationship with a major customer or supplier, included because of the potential for trust to develop over time (Blau, 1965; Cropanzano & Mitchel, 2005) or perceptions of trust to become more salient over time (Ambrose et al. 2010). *Contract size* is the annual sales volume with major customer or supplier. It was included because of the possibility that larger firms may develop greater trust than smaller firms (Autry & Golicic, 2010).

Questionnaires

There were two separate questionnaires, one where logistics service suppliers were asked about their trust of customers and one where customers were asked about their trust of logistics service suppliers. Respondents were instructed to respond with respect to the customer that their firm supplies the fourth highest volume of logistics service to or supplier that it receives the fourth highest volume of logistics service from. This was done to avoid external bias, while facilitating variability in the responses, based on Anderson and Narus' (1990) finding that relationships with suppliers of the highest or second-highest lines tends to be more uniformly positive, whereas relationships with the fourth highest are more variable.

The supplier and customer questionnaires contained mirrored items. For example, the supplier item “This customer is genuinely concerned that our business succeeds” is mirrored on the customer questionnaire as “This supplier is genuinely concerned that our business succeeds.” The items for the trustworthiness measures were intermingled and randomly arranged, to minimize response bias.

Pretesting

The questionnaire was pre-tested in two phases (Forza, 2002). First, a researcher met with three managers who were similar to potential respondents, asking whether the instructions and questions were clear, the time to complete the survey was adequate and whether they encountered any unexpected problems. The survey was then completed by a different set of three logistics professionals to allow performing exploratory assessment of measurement quality and investigate whether the answers to any questions were concentrated due to the choice of scale or differed from what was expected.

Data Collection

An electronic message containing the invitation letter and link to survey was sent to 5,759 potential respondents: 2,800 from the Abralog mailing list and 2,959 from Publicare. 1,162 messages bounced back (20%), leaving 4,597 valid email addresses. To increase the response rate (Forza, 2002), respondents were invited to attend a panel session that would be held at a local university to present the results. A reminder email was sent approximately 15 days after the initial invitation. Potential differences between the first and second waves of survey distribution were checked using t-tests and ANOVA (Armstrong & Overton, 1977; Corsten et al., 2011; Forza, 2002). The results showed that the mean values for the constructs were not significantly different. The survey yielded 173 responses (3.8% response rate), of which 83 were logistics service

customers (48%) and 90 were suppliers (52%). Ten of the customer responses and 15 of the supplier responses were excluded because of missing data, thus, the final sample consisted of 148 valid responses, of which 73 (50%) were customers and 75 (50%) were suppliers. Table 2 contains a detailed description of the respondents.

Panel Session

An expert panel session was conducted following survey administration and analysis. In order to include a broad range of managers from the logistics services industry, invitations were sent to survey respondents and members of the logistics center at the sponsoring university. A total of 36 logistics managers attended the session. It was facilitated by one of the researchers, the logistics center coordinator, a member of Abralog, and senior logistics managers from a large dairy company (a customer) and a large logistics services provider (a supplier). The remaining participants were managers from logistics services customers, logistics services providers and consulting companies.

Data Analysis

Measurement analysis. The means, standard deviations, ranges and distribution of the variables were analyzed (Forza, 2002), and no outliers or relevant differences were found. The skew indexes varied from -1.73 to $+0.43$ and kurtosis indexes varied from -1.34 to 4.36 . Both were considered within acceptable deviations from expected values (Kline 2005), therefore, parametric tests were used for conducting the analysis. Table 3 shows the factor loadings and Cronbach- α values for each of the scales. The two integrity items that were reversed scaled had low factor loadings in the three-dimension model and were therefore excluded. Similarly, one item was removed from the ability measure and an additional item was removed from the integrity measure, in order to improve their reliability.

Insert Table 3 about here

Hypothesis testing. The models were tested using multiple regression, with separate models for customers and suppliers. Models 1 and 2 used trust as the dependent variable, with the control variables (relationship length and contract size) and ability, benevolence and integrity as independent variables. Models 3 and 4 tested the competence-character model with the same control variables plus competence and character as the independent variables. Similarly, models 5 and 6 tested the affect-cognition model, with the same control variables plus affect-based trust and competence-based trust as the independent variables. Models 7-10 tested the relationship between trust and each of the dimensions of performance for customers, while models 11-14 did the same for suppliers.

RESULTS

Table 4 contains the analysis of the relationship between Mayer et al.'s (1995) dimensions of trustworthiness and trust for suppliers and customers. Both models were significant at $p < .001$, with R^2 values of .61 and .83, respectively. Ability ($p < .001$), benevolence ($p < .05$) and integrity ($p < .05$) were statistically significant for the supplier's perceptions of customers' trustworthiness, supporting H_{1a} and H_{3a}. Ability ($p < .01$) and benevolence ($p < .001$) were significant for customers' perceptions of suppliers' trustworthiness, supporting H_{1b} and H_{2b}. H_{2a} and H_{3b} were not supported. Thus, the analysis revealed differences in the antecedents to trust for suppliers and customers.

Insert Table 4 About Here

Tables 4b and 4c provide the results of the tests of the two alternative models. Each was statistically significant at $p < .001$ for both suppliers and customers and had R^2 values that were similar to those in the three-dimension model. While all of the R^2 values were relatively high, they were consistently higher in the customer models, relative to the supplier models.

Table 4b indicates that both character and competence were statistically significant for customers ($p < .01$ and $p < .001$) and suppliers ($p < .001$ and $p < .01$), supporting H_{4a} and H_{4b}. Similarly, Table 4c indicates that both affect-based trust and cognitive-based trust were significant for suppliers ($p < .001$ for both) and customers ($p < .001$ and $p < .01$), supporting H_{5a} and H_{5b}. Thus, all three models of the relationship between trustworthiness and trust were supported. The three-dimension model was the most informative, however, because it revealed differences in trustworthiness dimensions between suppliers and customers.

Table 5 contains the results of the analysis of the relationship between trust and performance for customers and suppliers. It reveals that trust was positively related to expectations about order accuracy ($p < .01$ and $p < .001$), quality ($p < .05$ and $p < .001$) and agreed-upon cost ($p < .05$ and $p < .001$), supporting H₆ through H₈. Trust was also related to on-time delivery expectations ($p < .001$) by suppliers, supporting H_{9a}, but not by customers. Thus, H_{9b} was not supported. For each of the performance models, the R² value and significance levels were stronger for the customer models, relative to the supplier models.

Insert Table 5 About Here

The panel of experts agreed with these results and described trust as contingent on the scope, size and specificity of the contracted service. According to the manager of a large dairy products company:

In a supply chain redesign project, we had two different scopes: reduce the network from four CDs to one, which was a low complexity service, and find a new provider with line feeding experience for a new plant. In the first case, the company opted for a short term (2 years) contract with more arm's length characteristics, and in the second case, for a long term contract with a local company because they didn't trust that the large, global and cheaper provider had the competence to deliver.

Customers and suppliers may not have the same view and expectation of the services they are managing. The experts described the Brazilian logistics market as not as mature as the market

in the U.S. or Europe. This may be due to poorly crafted or off-the-shelf contracts and excessive informal governance, leading to potential misalignment of expectations. For example, according to one expert, the procurement area is often responsible for negotiating logistics contracts, with only a few firms using logistics specialists for this task. As a consequence, contracts often are off-the-shelf and do not reflect the practical requirements of a logistics operation. At the same time, small and specialized service providers that claim to be logistics experts offer a broad range of unrelated services. In such cases, the contract may not contain a clear definition of scope, service level agreements are not formalized and performance metrics are not defined.

The experts also cautioned that the strength of interpersonal relationships in Brazil can be a negative, leading to business and personal matters becoming too interwoven, with an excess of informality. For example, sometimes clients do not understand the necessary bureaucracy and formalization demanded by a supplier's compliance processes prior to engaging in a new service, performance reviews are not in place and responsibilities are not clearly defined. Without such formalization, a substantial amount of effort is required to manage expectations or accusations that may arise when problems occur.

DISCUSSION

Key Findings

This study contributes to understanding supply chain relationships by showing that the relationship between supply chain trust and performance may not be applicable to customers and suppliers in the same manner. More specifically, we found that (i) customers and suppliers have different perceptions of the antecedents to trust, (ii) there are three related, but conceptually independent, antecedents to supply chain trust, and (iii) despite the positive relationship between

trust and performance, customers' perceptions of trust of a supplier has a greater impact on performance than suppliers' trust of a customer.

The theoretical foundations of this research provide an explanation for these differences. TCE suggests that opportunism, bounded rationality and environmental uncertainty impact measurement and monitoring costs. A firm may either limit resources for measuring performance and rely on more informal governance based on relational trust and where communication plays an important role, or spend resources to create more complex governance mechanisms (Poppo & Zenger, 2002; Rindfleisch & Heide, 1997). SET suggests that environmental and cultural issues may lead to different perceptions of relationships (Delbufalo, 2012; Mullen, 1995; Villena et al., 2011).

While all three models of trust antecedents (Mayer, et al., 1995; Gabarro, 1978; McAllister, 1995) were significant, Mayer, et al.'s (1995) three-dimension model provided the most useful results, showing the importance of different antecedents to trust for suppliers and customers. In line with previous literature (Ambrose et al., 2010; Barnes, Naude & Mitchell, 2007; Johnston, McCutcheon, Stuart & Kerwood, 2004; Nyaga et al., 2010; Svensson, 2001; Whipple & Frankel, 2000), results indicate that customers and suppliers may have different perceptions of their relationships. This was not unexpected, since trust is a subjective construct based on expectations and outcomes (Anderson & Narus, 1990; Blau, 1965; Swan & Nolan, 1985). For suppliers, customer ability and integrity are important in winning trust. Trusted customers have a good understanding of what needs to be done, which translates into clear instructions for the logistics service provider. In terms of integrity, trusted customers keep the logistics service provider informed about any problems that are encountered, provide relevant information and keep their

promises. The extent to which customers care about the interests of the logistics service providers (benevolence) was not important in establishing their trust.

On the other hand, ability and benevolence were important to customers in establishing trust in logistics service providers. Their competence and proficiency in storing or shipping customers' goods is an important antecedent to customers' trust. Benevolence is also important; customers value logistics service providers that operate with their best interests in mind. The extent to which logistics service providers provide information, inform customers about problems and keep promises (integrity) was not important in establishing their trust.

Our findings are consistent with Colquitt et al.'s (2007) meta-analysis:

Our results support the importance of all three trustworthiness dimensions, as all three had significant, unique relationships with trust (Colquitt, et al., 2017, p. 917-918).

This is especially interesting because of the differences between our research design and Colquitt, et al.'s (2007). Our research was set in the logistics service industry, while Colquitt, et al.'s (2007) study was a meta-analysis of research in many industries, including both manufacturing and service industries. The research analyzed by Colquitt et al. (2007) was at the individual level of analysis, using co-workers and team leaders as the referent for trustworthiness. Our research was at the interorganizational level of analysis, examining the antecedents of trust between firms in a supply chain. Thus, our research demonstrates that Mayer, et al.'s (1995) dimensions of trustworthiness are robust across levels of analysis. In addition, the research analyzed by Colquitt, et al. (2007) used behavioral performance measures, including risk-taking behaviors, citizenship behavior and counterproductive work behaviors, as well as perceptions of task performance. In contrast, our performance measures were perceptual measures of the extent to which order

accuracy, quality, cost and on-time delivery expectations had been met. Thus, the three-dimension perspective of trustworthiness is robust across performance measures.

Contributions

This research makes several important contributions to the literature on supply chain trust. First, it distinguishes between trustworthiness and trust in a supply chain. While establishment of trust is important in a supply chain, understanding the dimensions of trustworthiness provides managers with stepping stone for improving their firms' trustworthiness and hence contribute to developing trust with a customer or supplier. Second, it articulates three conceptually distinct dimensions of trustworthiness, building on both the seminal research by Mayer, et al. (1995) and Colquitt et al.'s (2007) meta-analysis of a substantial amount of research on individual level trust. Third, it finds that customers and suppliers differ in the dimensions of trustworthiness that are important to them in developing trust with exchange partners in a supply chain. Fourth, it shows that Mayer et al.'s (1995) three dimensions of trustworthiness are enduring, robust across contexts, levels of analysis and performance measures.

This research also studied specific outcomes that supply chain trust can predict. We found that supply chain trust is important to the standard measures of logistics service performance and that it is important to both supply chain suppliers and customers. Thus, supply chain trust is an important construct in supply chain research, benefitting both upstream and downstream supply chain members.

The specific context of this research was an emerging country with high environmental uncertainty and low interpersonal trust (ASEP/JDS, 2014; Confederação Nacional da Indústria - CNI, 2014). In such an environment, firms may be more likely to rely on informal governance, use inadequate assessment instruments, and have ineffective communication mechanisms, leading to

the perceptual gap identified in the research. The panel of experts supported this possibility because the logistics market in Brazil is not mature and is characterized by an immediatism culture and strong interpersonal relationships.

Managerial Implications

The findings from this research offer important implications for managers in supply chains. They show the practical benefit of fostering trust in a supply chain, linking it to expectations about supply chain performance. We found that perceptions of trustworthiness of a supply chain partner were different for customers and suppliers. By differentiating trust from trustworthiness, this research provides a practical guide for increasing trustworthiness for customers and suppliers. Managers should recognize that perceptions of their relationships are different. In an environment with high uncertainty, opportunistic behavior, an immediatism culture and operational stress, such as Brazil's, they should be more aware of the potential negative impact of governance based on excessive relational aspects. In this case, focusing communication efforts to align expectations and perceptions should help to improve logistics performance.

Limitations

Although the focus on both supplier and customer perceptions of trust and trustworthiness is a contribution of this research, it is important to remember that the supplier and customer samples were independent of each other. Focusing on dyads of suppliers and their customers will make an important contribution to future research on supply chain trust. In addition, single item measures were used for trust and the performance measures. Although we would argue that single item performance measures are clearer to understand and interpret than measures that aggregate different types of performance, we encourage future researchers to develop multiple item measures for each of these constructs.

Opportunities for Future Research

The arguments presented above may reflect power and dependence, which are relationship characteristics that can influence customer-supplier relationships. Oosterhuis, Molleman and Van Der Vaart (2013) argued that more powerful firms tend to be more focused on themselves and pay less attention to other firms. In asymmetric interfirm transactional relationships, actions that aim to foster trust appear to be a calculative strategy developed only by the more dependent partners to limit transactional risk (Donada & Nogatchewsky, 2006). This may be applicable to the sample used in this study, since 68% of customers classified their partner as a transportation company, a commoditized segment where suppliers are more dependent on the customer. Therefore, it would be interesting to extend this model to relationships where the supplier has greater power and is less dependent than the customer.

This research makes the argument that the long tradition in of trust research organizational behavior and marketing research provides a good foundation for research on supply chain trust. However, to date, the domain of most supply chain trust research has been limited to the existing supply chain literature on trust. We encourage future researchers to do a comprehensive systematic literature review on trust that draws upon supply chain management, organizational behavior, marketing and perhaps other domains to refine the supply chain trust construct.

There is substantial opportunity to make a contribution to the literature on supply chain trust through the study of dyads of suppliers and customers that have a supply chain relationship. Although collecting this type of data is very challenging, it has the potential to contribute insightful findings that could not be obtained through other types of research. Further, future research could complement survey research with qualitative case studies based on dyads or a supply chain

network, enabling involvement of respondents from multiple levels in combination with other sources of data.

CONCLUSIONS

This research empirically shows how customers' and suppliers' perspectives of trust and performance differ, and that the relationship between trust and performance may not be perceived by customers and suppliers in the same manner. Discussions with experts indicate that these findings may be due to environmental and cultural issues specific to the context of this research.

Confirming the findings of previous literature, we found that there is a positive relationship between supply chain trust and performance, but also that customers' trust of a supplier was more strongly related to performance than suppliers' trust of a customer. Although this seems reasonable since it is the customer who selects the supplier, additional possible reasons were identified in this research. One is related to the scope, size and specificity of the service provided because customers may deliberately differentiate between a closer and strategic supplier vs. a more arm's length relationship, and therefore, the levels of trust will be different. This may reflect power and dependence, since more powerful firms tend to be more focused on themselves, and more dependent firms tend to employ a calculative strategy to limit their transactional risk.

This research has only scratched the surface of supply chain trust. There are many opportunities to further develop this important construct and explore its relationships with other important supply chain factors and outcomes.

TABLE 1
Operationalizations of Supply Chain Trust

| Source | Perspective | Credibility | Benevolence | Ability | Integrity | Fairness | Reliability | Predictability | Honesty | Competence | Friendliness | Dependability | Character |
|--------------------------|---------------------|-------------|-------------|---------|-----------|----------|-------------|----------------|---------|------------|--------------|---------------|-----------|
| Ambrose, et al., 2010 | Matched dyads | • | • | | | | | | | | | | |
| Corsten, et al., 2011 | Suppliers | | • | | | | | | • | | | | |
| Donney& Cannon, 1997 | Customers | • | • | | | | | | | | | | |
| Ganesan, 1994 | Matched dyads | • | • | | | | | | | | | | |
| Gulati & Nickerson, 2008 | Customers | | | | | • | • | | | | | | |
| Ha, et al., 2011 | Suppliers | • | • | | | | | | | • | | | |
| Johnston, et al., 2004 | Matched dyads | | • | | | | | | | | | • | |
| Kwon & Suh, 2004 | Independent samples | | • | | | | | | • | | | | |
| Lado,et al., 2008 | Customers | • | • | | | | | | | | | | |
| Liu, et al., 2009 | Matched dyads | | • | | | | | | • | | | | |
| Mellewigt, et al., 2007 | Customers | • | • | | | | | | | | | | |
| Nyaga, et al., 2010 | Independent samples | • | • | | | | | | | | | | |
| Poppo, et al., 2008 | Customers | | | | | • | • | • | | | | | |
| Svensson, 2001 | Independent samples | | | | | | • | | • | • | • | | |
| Tian, et al., 2008 | Customers | | • | • | • | | | | | | | | |
| Whipple & Frankel, 2000 | Matched dyads | | | | | | | | | • | | | • |
| Zaheer, et all., 1998 | Matched dyads | | | | | • | • | | | | | | |

TABLE 2
Description of Respondents

| Relationship | | | Annual Value of | | |
|--------------------|-------|----------|------------------------|-------|----------|
| Duration | Buyer | Supplier | Contract | Buyer | Supplier |
| Less than 2 years | 13% | 17% | Less than R\$1 million | 36% | 16% |
| 2 to 5 years | 38% | 25% | R\$1 to 3 million | 30% | 29% |
| 5 to 10 years | 23% | 24% | R\$3 to 10 million | 21% | 16% |
| More than 10 years | 25% | 33% | R\$10 to 20 million | 5% | 8% |
| Missing | 1% | 0% | Missing | 8% | 20% |
| Total | 100% | 100% | Total | 100% | 100% |

TABLE 3
Measurement Analysis

| Measure | Items | Cronbach's Alpha | | Eigenvalue | | Factor Loadings | |
|--------------------------|-------|------------------|-----------|------------|-----------|-----------------|-----------|
| | | Buyers | Suppliers | Buyers | Suppliers | Buyers | Suppliers |
| Ability ¹ | COM1 | .93 | .87 | 2.64 | 2.38 | .94 | .92 |
| | COM2 | | | | | .91 | .85 |
| | COM3 | | | | | .96 | .90 |
| Benevolence ² | BEN1 | .83 | .83 | 2.25 | 2.25 | .88 | .89 |
| | BEN2 | | | | | .87 | .83 |
| | BEN3 | | | | | .85 | .89 |
| Integrity | HON2 | .82 | .66 | 2.23 | 1.80 | .86 | .78 |
| | HON3 | | | | | .45 | .76 |
| | CRE3 | | | | | .89 | .68 |
| | CRE4 | | | | | .79 | .67 |
| Cognition-Based Trust | CRE3 | .93 | .88 | 5.04 | 4.21 | .87 | .73 |
| | HON1 | | | | | .74 | .65 |
| | HON2 | | | | | .84 | .70 |
| | COM1 | | | | | .88 | .88 |
| | COM2 | | | | | .82 | .80 |
| | COM3 | | | | | .87 | .80 |
| Character | COM4 | .90 | .85 | 3.99 | 3.45 | .91 | .85 |
| | BEN1 | | | | | .88 | .79 |
| | BEN2 | | | | | .75 | .77 |
| | BEN3 | | | | | .82 | .86 |
| | CRE3 | | | | | .89 | .67 |
| | CRE4 | | | | | .75 | .74 |
| HON2 | .80 | .67 | | | | | |

¹ Identical to Competence

² Identical to Affect-Based Trust

TABLE 4
Antecedents to Trust

Table 4a: Three-Dimension Model (Mayer, et al., 1995)

| | Suppliers' Trust of Customers | | Customers' Trust of Suppliers | |
|-----------------------|------------------------------------|-------------|------------------------------------|-------------|
| | β | Sig. | β | Sig. |
| Constant | -.61 | .233 | .28 | .369 |
| Relationship Duration | .07 | .259 | -.04 | .348 |
| Contract Size | .02 | .698 | -.02 | .630 |
| Ability | .48 | .000 | .33 | .002 |
| Benevolence | .25 | .028 | .66 | .000 |
| Integrity | .37 | .000 | .05 | .652 |
| | F=21.41 p<.000 R ² =.61 | | F=64.72 p<.000 R ² =.83 | |

Table 4b: Affect-Based and Cognition-Based Trust (McAllister, 1995)

| | Suppliers' Trust of Customers | | Customers' Trust of Suppliers | |
|-----------------------|------------------------------------|-------------|------------------------------------|-------------|
| | β | Sig. | β | Sig. |
| Constant | -.30 | .557 | .20 | .525 |
| Relationship Duration | .05 | .488 | -.03 | .522 |
| Contract Size | .01 | .843 | -.02 | .505 |
| Affect-Based Trust | .33 | .002 | .72 | .000 |
| Cognition-Based Trust | .75 | .000 | .34 | .003 |
| | F=24.12 p<.000 R ² =.58 | | F=74.78 p<.000 R ² =.82 | |

Table 4c: Character and Competence (Gabarro, 1978)

| | Suppliers' Trust of Customers | | Customers' Trust of Suppliers | |
|-----------------------|------------------------------------|-------------|------------------------------------|-------------|
| | β | Sig. | β | Sig. |
| Constant | -.57 | .258 | -.10 | .758 |
| Relationship Duration | .07 | .272 | -.03 | .603 |
| Contract Size | .02 | .732 | -.02 | .490 |
| Character | .61 | .000 | .73 | .000 |
| Competence | .51 | .000 | .33 | .004 |
| | F=27.01 p<.000 R ² =.61 | | F=67.65 p<.000 R ² =.80 | |

TABLE 5
Relationship between Trust and Supply Chain Performance

Table 5a: Order Accuracy Expectations

| | Suppliers' Trust of Customers | | Customers' Trust of Suppliers | |
|-----------------------|-----------------------------------|-------------|------------------------------------|-------------|
| | β | Sig. | β | Sig. |
| Constant | 3.61 | .000 | 1.87 | .000 |
| Relationship Duration | .10 | .129 | .07 | .298 |
| Contract Size | -.08 | .078 | -.05 | .315 |
| Trust | .21 | .008 | .52 | .000 |
| | F=4.00 p<.015 R ² =.15 | | F=18.32 p<.000 R ² =.44 | |

Table 5b: Quality Expectations

| | Suppliers' Trust of Customers | | Customers' Trust of Suppliers | |
|-----------------------|-----------------------------------|-------------|------------------------------------|-------------|
| | β | Sig. | β | Sig. |
| Constant | 3.43 | .000 | 3.01 | .000 |
| Relationship Duration | .14 | .060 | .02 | .737 |
| Contract Size | -.08 | .086 | -.02 | .710 |
| Trust | .20 | .021 | .31 | .000 |
| | F=3.72 p<.015 R ² =.14 | | F=7.43 p<.000 R ² =.424 | |

Table 5c: Cost Expectations

| | Suppliers' Trust of Customers | | Customers' Trust of Suppliers | |
|-----------------------|-----------------------------------|-------------|------------------------------------|-------------|
| | β | Sig. | β | Sig. |
| Constant | 3.63 | .000 | 2.52 | .000 |
| Relationship Duration | .13 | .079 | -.01 | .909 |
| Contract Size | -.11 | .028 | -.03 | .562 |
| Trust | .21 | .014 | .46 | .000 |
| | F=4.30 p<.008 R ² =.15 | | F=15.01 p<.000 R ² =.40 | |

Table 5d: On-Time Delivery Expectations

| | Suppliers' Trust of Customers | | Customers' Trust of Suppliers | |
|-----------------------|-----------------------------------|------|-----------------------------------|-------------|
| | β | Sig. | β | Sig. |
| Constant | 3.93 | .000 | 2.59 | .000 |
| Relationship Duration | .04 | .515 | -.01 | .935 |
| Contract Size | -.04 | .435 | .04 | .391 |
| Trust | .15 | .069 | .37 | .000 |
| | F=1.43 p<.241 R ² =.06 | | F=7.53 p<.000 R ² =.25 | |

FIGURE 1
Three-Dimension Model of Supply Chain Trust

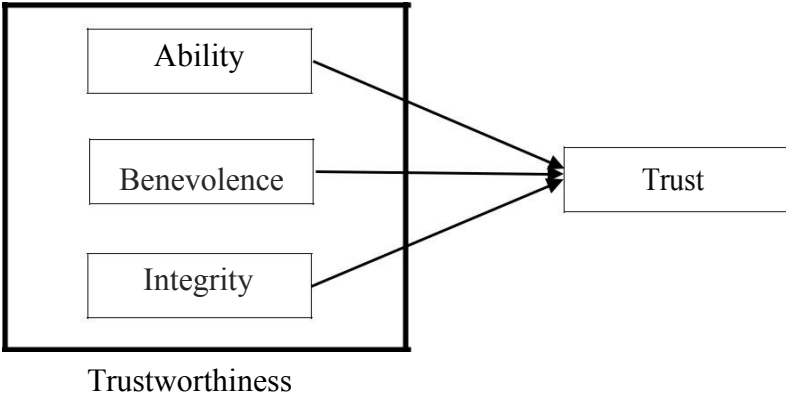


FIGURE 2
Competence-Character Model of Supply Chain Trust

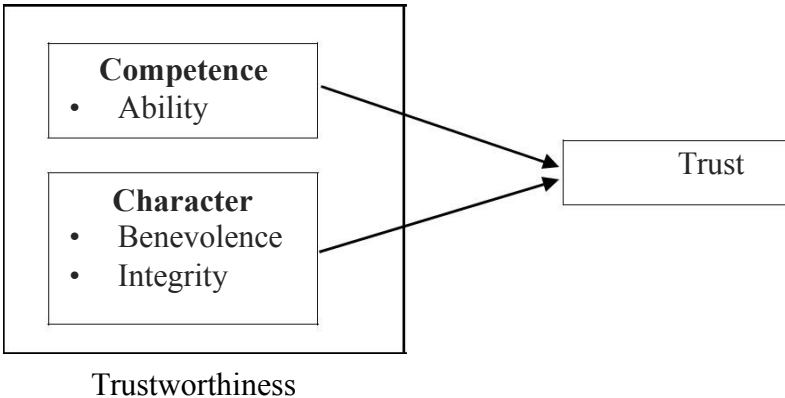
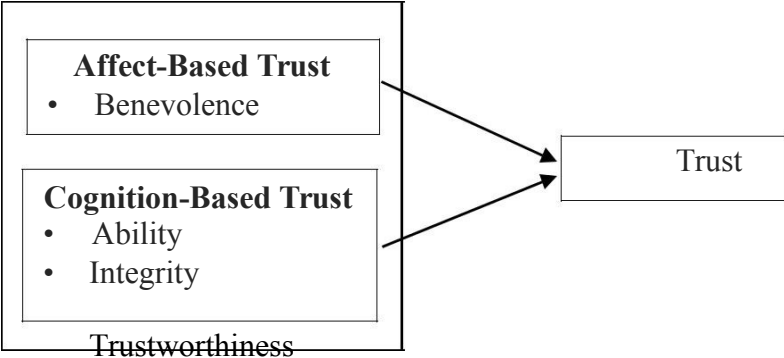


FIGURE 3
Affect-Based and Cognition-Based Model of Supply Chain Trust



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