

Relationship Satisfaction in B2B E-Commerce Trading Partnerships: The Countervailing Effects of Risk and Trust

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Abstract

This study investigates the antecedents of relationship satisfaction between B2B e-commerce trading partners. Relationship satisfaction is critical for sustaining long-term interorganizational relationships that allow for the development of interorganizational resources necessary to achieve sustainable competitive advantage. Using the relational view of the firm (Dyer and Singh, 1998) as a theoretical foundation, a research model is developed to investigate the direct and counterbalancing effects of organizational trust in the trading partner and trading partner B2B e-commerce risk on organizational relationship satisfaction. In addition, the indirect effects of justice and commitment are also considered.

Using a field survey, data are collected from 205 managers involved in B2B e-commerce trading partnerships and evaluated using structural equation modeling. The results support all hypotheses and provide good model fit, strong explanatory power, and strong support for the theory. The findings indicate that justice perceptions and commitment are instrumental to the formation of trust within the context of a B2B e-commerce trading relationship. In turn, trust enhances relationship satisfaction. However, risk diminishes relationship satisfaction, thereby serving as a counterpoint to the positive effects of trust.

This study makes contributions to interorganizational and accounting information systems research. First, this study addresses concerns on the relationship between risk and trust (Miller et al., 2008) by developing and testing the distinct and countervailing effects of risk and trust on B2B e-commerce partnerships. Second, this study contributes to research investigating interorganizational perceptions of procedural and distributive justice and the influence of justice perceptions on trading relationships (Luo, 2005; Beugre and Acar, 2008). Finally, this study addresses the call to acknowledge and consider the critical role of information technology in interorganizational relationships (Cuganesan and Lee, 2006; Granland, 2011).

Keywords: B2B E-commerce, Supply Chain Management, Interorganizational Relationships, Risk, Trust, Procedural Justice, Distributive Justice

1. Introduction

Global competition and hyper-competitive markets have altered organizational and academic views concerning the role and importance of business to business (B2B) supply chains. Critical to this changing view is the diffusion of information and communication technologies that enable B2B e-commerce trading partnerships. The emergence of the Internet as a stable and reliable medium for conducting e-commerce provides organizations and their suppliers a cost effective and non-proprietary means of establishing supply chain linkages. The ability of e-commerce technologies to reduce transaction costs within the B2B supply chain is well established. E-commerce enabled B2B supply chains produce substantial savings for organizations by reducing the amount of time and money necessary to negotiate contracts, process orders, and pay suppliers (Lucking-Reiley and Spulber, 2001). For example, British Telecom estimates the use of B2B procurement processes reduced transaction cost from £113 to £8 (Phillips and Meeker, 2000). These supply chain cost reductions are driving the adoption of B2B e-commerce supply chains. Within the U.S. market, 2008 manufacturer and wholesaler B2B e-commerce transactions reached \$3.416 billion, a 14.6% increase from 2007 (U.S. Census Bureau, 2010). In many industries, a supplier's ability to join an e-commerce enabled B2B supply chain is no longer optional, but required (Urbaczewski et al., 2002), particularly given these potential cost savings. However, organizational managers and researchers have expressed concern about the long-term viability of cost reduction as a sustainable competitive advantage (Straub and Watson, 2001).

Consistent with this view, the conceptualization of the B2B e-commerce supply chain as a cost reducing technology is transforming to incorporate B2B supply chains as an integral and critical component of organizational competitive advantage. Researchers have identified numerous benefits associated with B2B supply chains that can facilitate the creation of a sustainable competitive advantage. These factors include lower inventory levels, lower inventory carrying cost, fewer stock-outs, shorter order cycles, lower input prices, greater product availability (Leonard and Cronan, 2002), increased collaboration and planning between the organization and its suppliers to enable JIT inventory and delivery (Ngai and Wat, 2002), lean manufacturing and retailing, increased manufacturing flexibility (Wang et al., 2006), and new product and service development (Kulp et al., 2004). However, to achieve these potential benefits, organizations and their trading partners must shift from a transaction based supply chain focus to trading partnerships capable of creating, fostering, and sustaining competitive advantage (Hunt and Davis, 2008). The widespread adoption of B2B e-commerce technologies embedded within the larger context of interorganizational information systems mandates that these systems become an integral component to organizational strategies focused on the formation and implementation of interorganizational relationships capable of creating and sustaining competitive advantage. Interorganizational information systems are tightly integrated with the form and nature of interorganizational relationships (Chatterjee and Ravichandran, 2004).

The purpose of this study is to investigate the antecedents of relationship satisfaction between B2B e-commerce trading partners. Relationship satisfaction is critical for sustaining the long-term interorganizational relationships, such as B2B e-commerce trading partnerships, necessary to achieve sustainable competitive

advantage. Using the relational view of the firm (Dyer and Singh, 1998), a research model is developed to investigate the direct and counterbalancing effects of trust and risk on relationship satisfaction. In addition, the indirect effects of justice and commitment on relationship satisfaction are also investigated.

Using a web-based survey instrument, data are collected from 205 managers involved in B2B e-commerce trading partnerships. Results from data analysis support the overall model and the underlying precepts of the relational view of the firm. The findings indicate that, within the context of B2B e-commerce trading partnerships, justice perceptions and commitment are instrumental to the formation of trust in a trading partner. Trust, in turn, increases relationship satisfaction with the trading partner. However, perceptions of a trading partner's B2B e-commerce risk diminish relationship satisfaction.

This study makes several contributions to interorganizational relationship research. First, this research addresses concerns on the relationship between risk and trust (Miller et al., 2008) by developing and testing the distinct and countervailing effects of risk and trust on relationship satisfaction. Second, this study contributes to research investigating interorganizational perceptions of procedural and distributive justice (Luo, 2005; Luo, 2007; Brown et al., 2006; Beugre and Acar, 2008) and the influence of justice perceptions on relationship satisfaction. Finally, this study addresses the call by researchers to acknowledge and examine the critical role of information technology in interorganizational relationships (Cuganesan and Lee, 2006; Granland, 2011).

The remainder of this paper proceeds as follows. Section 2 discusses the relational view of the firm and develops the research model and hypotheses. Section 3 presents the methodology. Section 4 reports the results and section 5 presents conclusions, limitations, and implications of the research findings.

2. Theory and Hypotheses Development

The relational view of the firm (Dyer and Singh, 1998) provides the theoretical foundation for understanding relationship satisfaction within the context of B2B e-commerce trading partnerships. Developed to explain how and why firms achieve competitive advantage from the formation and development of interorganizational alliances, the relational view of the firm (RVF) is an evolutionary extension of the resource based view of the firm (RBV) (Barney, 1991). Similar to RBV, RVF seeks to explain how firms obtain, develop, and use valuable, rare, inimitable and non-substitutable resources to achieve sustainable competitive advantage (Barney, 1991; Kraaijenbrink et al., 2010). However, unlike RBV, RVF does not require a firm to own or control resources to achieve sustainable competitive advantage—instead RVF recognizes "...the (dis)advantages of an individual firm are often linked to the (dis)advantages of the network of relationships in which the firm is embedded" (Dyer and Singh, 1998 p. 660). RVF recognizes that firms can achieve a sustainable competitive advantage through the formation and development of interorganizational relationships such as strategic alliances, joint-ventures, and long-term buyer-supplier partnerships (Gulati et al., 2000). These interorganizational relationships are particularly relevant within the context of B2B e-commerce buyer-supplier interactions as the diffusion and widespread adoption of B2B e-commerce technologies casts doubt on

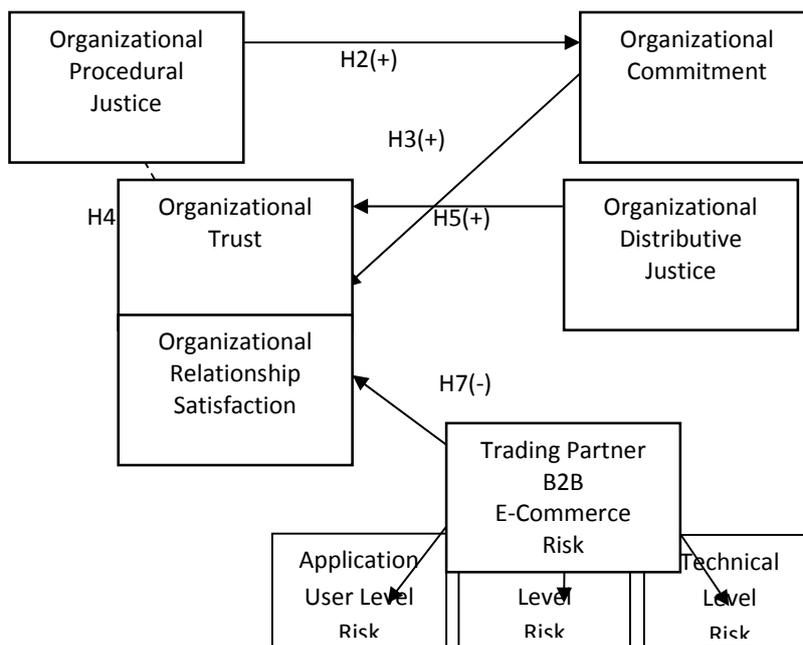
whether reduced transaction costs are a sustainable competitive advantage (Benjamin et al., 1990). In their discussion of B2B supply chain practice and research, Straub and Watson (2001 p. 340) conclude that “The initial competitive advantages of network connectivity are not sustainable, any more than many other IS resources have been.” The technologies that enable B2B e-commerce trading partnerships are no longer rare or inimitable—however; the relationships engendered through buyer-supplier interactions remain unique sources of sustainable competitive advantage. Within RVF, the interorganizational relationships, and associated processes, procedures, and assets created within the relationships, are the rare, valuable, inimitable, and non-substitutable resources that ultimately allow organizations to achieve sustainable competitive advantage.

RVF identifies four categories of determinants of interorganizational sustainable competitive advantage that can be derived from participation in relational networks: relation specific assets, knowledge sharing routines, complementary resources and capabilities, and effective governance (Dyer and Singh, 1998). Relation specific assets are those assets intended to work in conjunction with the assets of a partner firm (Teece, 1987; Williamson, 1985). Knowledge sharing routines are processes and procedures that allow the transfer, recombination, or creation of specialized, and frequently tacit, knowledge within the relational network (Malhotra, 2005). Complementary resources represent the combined resources of individual interorganizational relationship members. Individually, each member possesses unique, rare, and non-substitutable resources that when combined produce new resources that are greater than the sum of their parts (Dyer and Singh, 1998). Effective governance, while distinct from the other four determinants of interorganizational competitive advantage, interacts with and facilitates the formation and development of asset specificity, knowledge sharing routines, and complementary resources. Effective governance refers to a broad range of safeguards that are informal, frequently specialized to the parties involved, share the common characteristic of self-enforcement, and develop over time. These safeguards are intended to provide benefits to both relationship partners by simultaneously lowering transaction costs and encouraging flexibility and cooperation while discouraging the risk of opportunistic behavior (Dyer and Singh, 1998). In a study of Taiwanese manufacturing firms, Wang et al. (2006) find that B2B e-commerce integration within the supply chain allows greater collaborative process planning and control between manufacturers and their suppliers. This collaborative relationship represents a relational resource that allows greater manufacturing flexibility through increased supplier responsiveness. Manufacturers are able to substitute “information for inventory” (Wang et al., 2006 p. 47) to improve both the manufacturer’s and supplier’s resource use. Increases in manufacturing flexibility allow organizations to quickly respond to the demand uncertainty characteristic of hypercompetitive markets. Thus, demand uncertainty is transformed from an organizational threat to a sustainable competitive advantage.

Consistent with RVF, B2B e-commerce trading partnerships provide sustainable competitive advantage when both buyers and suppliers are engaged in mutually beneficial and satisfying relational networks. Participation in trading partnerships affords both buyer and supplier the opportunity and time to develop the processes and procedures necessary to achieve sustainable competitive advantage. Buyer-supplier

interactions evolve from a short-term transaction based focus to a long-term relational focus where both parties are willing to forgo short-term, one-sided gains to achieve long-term benefits (Morgan and Hunt, 1994). Within the trading partnership, buyers and suppliers no longer operate as separate entities but instead view themselves as mutually interdependent members of an extended organizational supply chain (Schorr, 1998; Chapman and Corso, 2005; Hunt and Davis, 2008). This extended organizational supply chain competes against other extended organizational supply chains and is focused on achieving a level of relationship satisfaction necessary to ensure the development and maintenance of sustainable competitive advantage from the trading partnership. The remainder of this section is focused on the antecedents of relationship satisfaction. Figure 1 presents the research model developed to investigate the indirect effects of justice perceptions and commitment and the direct and countervailing effects of trust and risk on relationship satisfaction. The research model is developed from the perspective of the organization's view of its relationship with a selected trading partner. Thus, the terms "organization" and "trading partner" are used to refer to the two entities respectively.

Figure 1: Research Model



2.1 Justice, Commitment, and Trust

Trust is essential for the formation and continuation of any successful relationship. Within an interorganizational context, trust is the confident expectation that all parties to an exchange will perform their roles with competence, with duty, and with goodwill (Hart and Saunders, 1998; Zaheer, et al., 1998). Organizational trust of the trading partner is critical for the development of relationship satisfaction. Absent trust

that a trading partner possesses adequate technological safeguards, such as firewalls, digital signatures, current virus protection software, and other e-commerce best practices, organizations will not initiate e-commerce linkages (Ratnasingam and Phan, 2003). Thus, a minimal level of trust is necessary for the formation of trading partnerships. However, to achieve the level of relationship satisfaction necessary for sustainable competitive advantage, trust must incorporate procedures and practices that are not reliant on contracts or third party sanctions, but instead use self-enforcing safeguards, processes, and routines to manage interorganizational exchanges (Dyer and Chu, 2000).

The existence of informal self-enforcing safeguards manifests in perceptions of procedural justice. Procedural justice is the extent to which the decision making processes and procedures that impact the organization's and trading partner's interests are perceived as impartial and fair (Luo, 2007). Central to procedural justice within interorganizational relationships is a focus on mutually beneficial procedures intended to foster growth (Luo, 2007). High levels of procedural justice improve process efficiency by creating standards for expected behavior and relational norms that reduce the need for contracts (Tyler, 1989), allowing for greater flexibility and responsiveness along the supply chain. Thus, procedural justice enables effective governance through the establishment of decision making processes and procedures, expectations for appropriate behaviors, and relation norms. Dyer and Hatch (2006) attribute Toyota's superior component parts defect reduction rate to interorganizational routines and policies that enable greater knowledge sharing with suppliers. Greater knowledge sharing allowed a faster rate of learning within supplier's manufacturing processes resulting in a 50 percent reduction in defect rates. Conversely, U.S. automakers, using the same suppliers, but subject to more restrictive interorganizational routines and policies that inhibit knowledge sharing, achieved a 26 percent defect rate reduction over the same time period. These differences persisted over the six-year period of the study. Procedural justice permitted Toyota and its supplier to develop knowledge sharing routines that provide a sustainable competitive advantage. In a study of cross-cultural cooperative alliances, Luo (2005) finds that shared perceptions of high levels of procedural justice produce greater financial returns for alliance partners in conditions of high structural uncertainty. Under conditions of high procedural justice, trading partners are more willing to engage in practices that benefit the organization (Griffith et al., 2006), thereby enhancing trust in the trading partner.

Hypothesis 1: *Higher levels of procedural justice are positively associated with organizational trust in the trading partner.*

Actions that benefit the trading partnership also signal the desire to maintain a valued trading partnership. Of key importance to organizations and their trading partners is organizational commitment to the trading relationship. Commitment is the belief that initial investments in maintaining a trading partnership will result in the long-term survival and growth of the relationship. Commitment justifies the expenditure of resources necessary to form and enhance integrated B2B e-commerce systems capable of achieving sustainable competitive advantage. Resource expenditures can include investments in relation specific assets such as IT hardware and software (Son

et al., 2005; Lui, 2009) or employee training in partner specific business processes (Patnayakuni et al., 2006) to facilitate the development of relational norms that guide exchanges between trading partners. Further, the development of relational norms to guide interorganizational interactions increases an organization's commitment to its trading partner (Jap and Ganesan, 2000). Investments in developing and strengthening the trading partnership represent a tangible manifestation of commitment (Son et al., 2005). Within the context of RVF, these investments represent relation specific assets and complementary resources necessary for achieving sustainable competitive advantage (Klein and Rai, 2009), and indicate that both the organization and its trading partner perceive the relationship as crucial and important (Morgan and Hunt, 1994). Thus, high levels of perceived procedural justice, made tangible through the existence of relational norms, increase commitment to the trading partnership (Lou, 2005; Kwong and Leung, 2002) by directing actions through shared perceptions of appropriate behavior.

Hypothesis 2: *Higher levels of procedural justice are positively associated with organizational commitment to the trading partner.*

Commitment forms the foundation for the development of trading partnerships. Commitment indicates the desire for a long-term trading relationship and is influenced by prior experiences and interactions (Free, 2008). As previously discussed, organizations will not commit to trading partnerships absent a minimal level of trust—however, for the trading relationship to move beyond a transaction based exchange to a trading partnership capable of creating and maintaining sustainable competitive advantage, trust must deepen. Commitment and trust foster greater cooperation, reduce functional conflict, enhance decision making under conditions of uncertainty, and reduce the propensity of trading partners to exit the exchange relationship (Morgan and Hunt, 1994; Palmatier et al., 2006). Mukhopadhyay and Kekre (2002) compare B2B e-commerce and traditional trading partnerships. They show that the initiation of B2B e-commerce linkages does not increase transaction volume; however, organizational implementation of the B2B e-commerce systems and subsequent trading partner development of advanced B2B e-commerce linkages results in improved strategic and operational benefits for both the organization and the trading partner. Thus, commitment is instrumental to achieving integrated information systems capable of achieving sustainable competitive advantage. In an analysis of EDI supply chain partners, Hart and Saunders (1998) find that supplier commitment to the trading relationship is a precursor to the development of trading partner trust. Trust and commitment, in the form of relationship specific asset investment, also increase the volume (Hart and Saunders, 1998) and diversity of B2B e-commerce transactions (Son et al., 2005). Further, mutual trust between the organization and its trading partner positively influences the strategic information flows necessary to create knowledge sharing routines (Klein, 2007; Klein and Rai, 2009). Thus, the prior experiences and interactions necessary to form commitment subsequently influence and change perceptions of trust.

Hypothesis 3: *Higher levels of organizational commitment to the trading partner are positively associated with organizational trust in the trading partner.*

As previously discussed, high levels of procedural justice improve process efficiency by creating standards for expected behaviors that reduce the need for contracts (Tyler, 1989) and facilitate the development of relational norms. These standards for expected behavior guide a trading partner's actions and impact perceptions of commitment. In turn, commitment enables the repeated interactions necessary for organizations and their trading partners to form and update trust beliefs (Tomkins, 2001).

Hypothesis 4: *The impact of procedural justice on the organization's trust of the trading partner will be mediated by organizational commitment to the trading partner.*

While organizations are concerned with the effects of procedural justice on trust, the input to output ratio, or distributive justice, also impacts trust. Distributive justice is defined as the perceived fairness of the distribution of rewards and costs between trading partners (Colquitt, 2001). The financial benefits of B2B e-commerce supply chains include lower inventory levels and carrying costs, reduced stockouts, shorter order cycles (Leonard and Cronan, 2002), and increased revenue growth (Rai et al., 2006). Rewards, while typically financial, can also include access to new technologies, markets, production processes (Beugre and Acar, 2008), knowledge acquisition (Luo, 2007), and information sharing (Rai et al., 2006; Kannan and Tan, 2002). Like procedural justice, organizational perceptions of distributive justice received from the trading partner influence relationship satisfaction through trust. Equity in the distribution of outcomes and rewards validates prior trust in the trading partner and enhances future trust necessary for the creation, maintenance, and enhancement of interorganizational resources needed to achieve sustainable competitive advantage from the trading partnership. In conditions of high distributive justice, organizational relational behaviors and long-term orientation towards trading partners increase (Brown et al., 2006). Equitable outcomes reduce trading partner conflict (Griffith et al., 2006; Brown et al., 2006) and increase trust that the trading partner will not participate in opportunistic behaviors (Dyer and Singh, 1998).

Hypothesis 5: *Higher levels of organizational distributive justice attributable to the trading partner are positively associated with organizational trust in the trading partner.*

2.2 Trust, Risk, and Relationship Satisfaction

Relationship satisfaction is "a positive affective state resulting from the appraisal of all aspects of a firm's working relationship with another firm" (Geyskens et al., 1999 p. 224). Satisfaction with the trading partnership provides the incentive for organizations and their trading partners to devote the time, effort, and resources necessary to transform buyer-supplier interactions from transactional exchanges to interorganizational relationships capable of producing sustainable competitive

advantage (Geyskens et al., 1999). Back office integration, managerial skills, and partner support are critical to enhancing process performance and competitive advantage from trading partnerships (Dong et al., 2009). Highly integrated and collaborative trading partnerships enable the exchange of diverse, high quality, and privileged information between trading partners to facilitate joint decision making, increases in operational efficiency, and gains in market knowledge (Malhotra et al., 2005; Saraf et al., 2007). Information sharing, knowledge creation, back office integration, and the managerial skills necessary to leverage trading partner interactions develop over time (Sobrero and Roberts, 2001; Jap and Ganesan, 2000; Hunt and Davis, 2008; Subramani, 2004; Patnayakuni et al., 2006) and are facilitated by the existence of a mutually satisfying trading relationship. Thus, relationship satisfaction is a key to the success of interorganizational relationships (Dwyer, 1980), such as B2B e-commerce trading partnerships.

The research model presented in Figure 1 identifies two key and opposing dimensions of relationship satisfaction—organizational trust of the trading partner and trading partner B2B e-commerce risk. This conceptualization is consistent with the central tenant of RVF—that organizations engaged in interorganizational relationships are subject to both the advantages and disadvantages inherent in the interorganizational relationship (Dyer and Singh, 1998). The need for trust is predicated on the existence of risk (Das and Teng, 2001; Bhattacharya et al., 1998). Within the trading partnership, trust is valuable when conditions exist for a partner to behave opportunistically (Ring and Van de Ven, 1994). Power (2007) suggests that risk management has become the dominant focus of corporate governance. Recent research focused on evaluating and controlling risk within interorganizational relationships supports this contention (Das and Teng, 2001; Colletti et al., 2005; Caglio and Ditillo, 2008; Dekker, 2004; Dekker, 2008). Trust, while still instrumental to the achievement of sustainable competitive advantage from B2B e-commerce systems, may not be sufficient to mitigate the risk inherited from collaborative supply chain relationships (Miller et al., 2008). Instead, risk is emerging as a unique and key deterrent to the formation of sustainable competitive advantage in trading partnerships (Aron et al., 2005; Goh et al., 2007).

Trust, as previously defined, is the confident expectation that all parties to an exchange will perform their roles with competence, with duty, and with goodwill (Hart and Saunders, 1998; Zaheer, et al., 1998). Trust enhances exchange performance by reducing the need for formal governance structures and monitoring (Gulati and Nickerson, 2008). Trust is critical to trading partnerships as organizations, to achieve sustainable competitive advantage, must also ‘purchase’ their trading partners information systems and capabilities (Handfield and Bechtel, 2002). Nicolaou and McKnight (2006) find that trust positively influences intentions to use interorganizational information systems—a key requirement to achieving sustainable competitive advantage from trading partnerships. Trust, developed over time through interorganizational learning and adaptation processes, strengthens trading partnerships by encouraging knowledge exchange and mutual promotion of organizational and trading partner interests (Langfield-Smith and Smith, 2003). Thus, trust effects relationship satisfaction by providing confidence about the long-term positive behavior

of the trading partner towards the organization and the trading relationship (Palmatier et al., 2006).

Hypothesis 6: *Higher levels of organizational trust in the trading partner are positively associated with organizational relationship satisfaction.*

In a study of global B2B e-commerce supply chains, Arnold et al. (2010) find an organization's perception of trading partner B2B e-commerce risk reduces the organizations willingness to share information. Reduced information sharing hinders the formation of knowledge sharing routines necessary for sustainable competitive advantage (Dyer and Singh, 1998). Risk perceptions also reduce the intention to use interorganizational information systems (Nicolaou and McKnight, 2006). Absent use of the B2B e-commerce system, sustainable competitive advantage from trading partnerships cannot be realized.

Risk in the context of the trading partnerships is a multidimensional construct composed of application user level, business level, and technical level risks (Khazanchi and Sutton, 2001). Application user level risk focuses on the decision makers' choices and rationale for B2B e-commerce implementation. For example, organizations may use their coercive power, derived from trading partner dependence on the organization, to mandate that trading partners implement B2B e-commerce systems. However, this strategy can reduce the volume and diversity of transactions (Hart and Saunders, 1998). Business level risks are concerned with the effective implementation and integration of B2B e-commerce technologies to the existing organizational structure and back office systems. Absent successful integration and appropriate business process reengineering, trading partners cannot assist the organization in achieving sustainable competitive advantage (Malhotra et al., 2005; Saraf et al., 2007). Finally, technical level risks address whether trading partners possess the technologies, or the capital necessary to obtain the technologies, to enable B2B e-commerce integration with the organization (Khazanchi and Sutton, 2001). In combination, application user level, business level, and technical level risk provide an indication of B2B e-commerce risk. Sophisticated information technology infrastructures give organizations and their trading partners the flexibility necessary to adjust to changing business conditions and demands (Armstrong and Sambamurthy, 1999; Mishra and Agarwal, 2010). As trading partnerships develop, organizations and their trading partners become intertwined in order to facilitate the processes, such as knowledge sharing routines, necessary to achieve sustainable competitive advantage. Unfortunately, this tight coupling also exposes organizations to their trading partners' B2B e-commerce risk and diminishes relationship satisfaction. Organizations can outsource processes, but they cannot outsource the risks associated with work stoppages and supply chain disruptions (Ernst & Young, 2004).

Hypothesis 7: *Higher levels of trading partner B2B e-commerce risk are negatively associated with organizational relationship satisfaction.*

3. Research Methods

The research model presented in Figure 1 is tested in the overall context of a structural model. Support of the overall model is critical to establishing the direct effects of trust and risk on relationship satisfaction as well as the indirect effects of the antecedents to trust. Hence, the hypotheses are also examined simultaneously within the overall context of the model.

3.1 Data Collection

The focus of this study is interorganizational relationships within the context of B2B e-commerce trading partnerships. Consistent with prior interorganizational research (Yilmaz et al., 2004; Luo, 2005; Luo, 2007; Beugre and Acar, 2008), individuals with the knowledge, expertise, and experience to evaluate B2B e-commerce trading partnerships are deemed suitable participants as their opinions and beliefs guide organizational perceptions concerning the trading partnership and influence B2B e-commerce interactions. In order to test the research model and hypotheses, a web-based survey instrument was used. Chief Information Officers (CIOs), information systems security specialists, IT internal audit specialists with e-commerce experience, and e-commerce development staff represent suitable participants for this study as they possess the knowledge, experience, and expertise to assess their organization's interactions with trading partners. To assess ease of use, clarity, and completion time, the web-based survey was pretested by 42 individuals with knowledge and expertise similar to potential study participants. Individuals participating in the pretest phase of this study were excluded from further participation in the study, and their responses were not used for data analysis beyond the pretest phase.

A survey company was employed to target and solicit suitable participants for this study. Initial contact was made via e-mail using job titles as an indicator of a participant's suitability for participation in the study. A total of 1,021 individuals responded to the initial contact and began the survey at the survey company's web site. To participate in the study, each respondent answered the following four questions designed to further assess their suitability for participation in the study:

- Does your organization have experience in working with trading partners (e.g., suppliers, customers, outsourcers, etc.) in a B2B e-commerce relationship?
- Does your organization repeatedly transact with any such trading partners?
- Do you have a basic understanding of the technological and IT-driven components of B2B e-commerce?
- Do you have a reasonable understanding of any of your trading partners' B2B e-commerce capabilities and your firm's relationship with this partner?

A "yes" response to all four questions was required to access the survey and continue participation in the study. Subsequent to completing the pre-screening questions, 149 of the 1,021 initial potential participants were eliminated. Of the remaining 872 qualified respondents, 266 (30.50 percent) completed the survey. Upon receipt of the completed survey, 11 surveys were eliminated due to response inconsistencies and an additional 50 were deemed unusable because of excessive missing data. The final sample consists of 205 usable completed surveys representing a response rate of 77.06 percent. Descriptive statistics related to demographic information provided by survey respondents are presented in Table 1. Survey respondents were asked to identify and

evaluate a B2B e-commerce trading partner with which they were most familiar based on their job duties. Either an internal (e.g., separate business division or other related party) or external B2B e-commerce trading partner could be evaluated. The majority (90.73 percent) of survey respondents evaluated external B2B e-commerce trading partners (results not tabulated). B2B e-commerce trading partnerships require time to transform from the transactional to the relational. Demographic data indicate 95.12 percent of the organizations represented in the survey have been using B2B e-commerce systems between 1 and 29 years. The majority of organizations (92.20 percent) are publicly traded. At 25.37 percent, manufacturing was the predominant industry segment. Customers are the most frequent trading partners followed by wholesalers, manufacturers, and financial institutions. Purchasing, followed by administration, and partner information exchanges are the most common B2B e-commerce functionalities used with all trading partners and the specific trading partner evaluated for this study. Based on the demographic data discussed above and presented in Table 1, the organizations represented in this study have dedicated, and diverse B2B e-commerce trading partnerships capable of creating sustainable competitive advantage.

Table 1: Participant and Organizational Demographics (continued)

Category	Frequency (n = 205)	Percent
<i>Length of time your organization has used B2B e-commerce (in years)</i>		
<1	5	2.44
1-5	69	33.66
5-9	63	30.73
9-13	29	14.15
13-17	19	9.27
17-21	10	4.88
21-25	3	1.46
25-29	2	0.98
>29	3	1.46
Not answered	2	0.98

† Multiple items could be selected

Table 1: Participant and Organizational Demographics

Category	Frequency (n = 205)	Percent
<i>Gender</i>		
Male	193	94.15
Female	12	5.85
Not Answered	0	0.00
<i>Age (in years)</i>		
<22	1	0.49
22-27	1	0.49
27-32	9	4.39
31-37	34	16.59
37-42	37	18.05

42-47	37	18.05
47-52	32	15.61
52-57	29	14.15
>57	23	11.22
Not answered	2	0.98
Experience in current job function (in years)		
<1	1	0.49
1-5	25	12.20
5-9	53	25.85
9-13	48	23.41
13-17	25	12.20
17-21	20	9.76
21-25	19	9.27
25-29	13	6.34
>29	0	0.00
Not answered	1	0.49
Organizational Structure		
Publicly traded	189	92.20
Not publicly traded	12	5.85
Not answered	4	1.95
Industry		
Manufacturing	52	25.37
Insurance	17	8.29
Financial/real estate	16	7.80
Wholesale/retail	22	10.73
Technology	3	1.46
Utilities	8	3.90
Health	18	8.78
Communication	1	0.49
Aerospace & defense	27	13.17
Transportation	9	4.39
Other	29	14.15
Not answered	3	1.46
B2B e-commerce functions conducted with this trading partner[†]		
Purchasing/Order Management	153	74.63
Administration (including price/sales catalog)	73	35.61
Sales Analysis/Inventory Management	60	29.27
Billing/Payment	123	60.00
Shipping/Receiving	101	49.27

Table 1: Participant and Organizational Demographics (continued)

Category	Frequency (n = 205)	Percent
B2B e-commerce functions conducted with this trading partner[†] (continued)		
Bidding/Quotation (including RFP)	62	30.24
Partner Information/Acknowledgement	56	27.32
Other	13	6.34
Not answered	1	0.49
B2B e-commerce functions used by your organization[†]		
Purchasing/Order Management	153	74.63
Administration (including price/sales catalog)	73	35.61
Sales Analysis/Inventory Management	60	29.27

Billing/Payment	123	60.00
Shipping/Receiving	101	49.27
Bidding/Quotation (including RFP)	62	30.24
Partner Information/Acknowledgement	56	27.32
Other	13	6.34
Not answered	1	0.49
<i>B2B e-commerce purchase with this trading partner for current fiscal year (in dollars)</i>		
< 250,000	65	31.71
250,000-750,000	29	14.15
750,000-2.25 million	42	20.49
2.25 million-2.75 million	4	1.95
2.75 million-3.25 million	5	2.44
3.25 million-3.75 million	4	1.95
3.75 million-4.25 million	2	0.98
4.25 million-4.75 million	3	1.46
>4.75 million	44	21.46
Not answered	7	3.41
<i>B2B e-commerce sales with this trading partner for current fiscal year (in dollars)</i>		
< 250,000	68	33.17
250,000-750,000	22	10.73
750,000-2.25 million	33	16.10
2.25 million-2.75 million	9	4.39
2.75 million-3.25 million	2	0.98
3.25 million-3.75 million	4	1.95
3.75 million-4.25 million	4	1.95
4.25 million-4.75 million	4	1.95
>4.75 million	50	24.39
Not answered	9	4.39
<i>All trading partners your organization currently uses B2B e-commerce to transact business with[†]</i>		
Customers (e.g., Retailers, Supermarkets, etc.)	128	62.44
Wholesalers/Distributors	115	56.10
Manufacturers	100	48.78
Financial Institutions	87	42.44
Shipping Companies	66	32.20
Government (e.g., Customs)	45	21.95
Other	11	5.37
Not answered	1	0.49

Table 1: Participant and Organizational Demographics (continued)

Category	Frequency (n = 205)	Percent
<i>Length of time your organization has used B2B e-commerce (in years)</i>		
<1	5	2.44
1-5	69	33.66
5-9	63	30.73
9-13	29	14.15
13-17	19	9.27
17-21	10	4.88
21-25	3	1.46
25-29	2	0.98

>29	3	1.46
Not answered	2	0.98

† Multiple items could be selected

3.2 Development of Measures

All item measures use a 7-point Likert type scale anchored on 1 indicating a strong negative perception and 7 indicating a strong positive perception. In addition, participants have the option to select “No basis for judgment”. Measurement items for the reflective constructs organizational perceptions of procedural justice present in the trading partnership (Kumar et al., 1995), organizational perceptions of distributive justice received from the trading partnership (Kumar et al., 1995), organizational commitment to a trading partner (Ganesan, 1994; Hart and Saunders, 1998), organizational trust in a trading partner (Hart and Saunders, 1998), and organizational satisfaction with the trading relationship (Ganesan, 1994) were adapted from prior studies. As these scales were adapted from prior research, scale validity was assessed during measurement model testing using confirmatory factor analysis (CFA). CFA results indicated all measurement items loaded on their corresponding construct at a level greater than 0.70 (Hair et al., 2010), with the exception of the first measurement item for commitment (com1), which loaded on the commitment construct at 0.64. However, further analysis of the commitment scale indicated a composite reliability of 0.86 and an average variance extracted (AVE) of 0.68. Given these acceptable indicators of scale validity (Hair et al., 2010), com1 was retained as a measurement item for the commitment scale. Table 2 contains the item measures, medians, means, standard deviations, and item loadings for the reflective construct item measures.

Table 2: Descriptive Statistics for Reflective Measurement Items

Variable Measures	Item Name	Range	Median	Mean	Std. Dev.	Item Loading
Organizational Procedural Justice (Kumar et al., 1995)						
Your organization promotes bilateral communication with this trading partner. 1) Strongly Disagree to 7) Strongly Agree	pj1	7.00	6.00	5.34	1.61	0.86
Your organization applies consistent policies and decision-making procedures with this trading partner. 1) Strongly Disagree to 7) Strongly Agree	pj2	7.00	6.00	5.26	1.52	0.85
Your organization provides valid reasons for any changes in policies affecting this business partner. 1) Strongly Disagree to 7) Strongly Agree	pj3	7.00	6.00	5.34	1.49	0.91
Organizational Commitment (Hart and Saunders, 1998; Ganesan, 1994)						

Variable Measures	Item Name	Range	Median	Mean	Std. Dev.	Item Loading
Your organization expects the relationship with this trading partner to last a lifetime. 1) Strongly Disagree to 7) Strongly Agree	com1	7.00	5.00	4.68	1.67	0.64
Your organization believes that over the long run the relationship with this trading partner will be profitable. 1) Strongly Disagree to 7) Strongly Agree	com2	7.00	6.00	5.27	1.52	0.88
Your organization focuses on long-term goals with this trading partner. 1) Strongly Disagree to 7) Strongly Agree	com3	7.00	6.00	5.48	1.57	0.92
Organizational Trust (Hart and Saunders, 1998)						
Deadlines set by this trading partner are honest and accurate. 1) Strongly Disagree to 7) Strongly Agree	trt1	7.00	5.00	5.10	1.44	0.80
This trading partner is honest in business dealings. 1) Strongly Disagree to 7) Strongly Agree	trt2	7.00	6.00	5.52	1.42	0.89
This trading partner is willing to share information 1) Strongly Disagree to 7) Strongly Agree	trt3	7.00	6.00	5.27	1.38	0.84
Organizational Distributive Justice (Kumar et al., 1995) <i>How fair are your organization's outcomes and earnings compared to:</i>						
The roles and responsibilities this trading partner assigns to our organization. 1) Extremely Unfair to 7) Extremely Fair	dj1	7.00	5.00	5.06	1.33	0.96
What other organizations in your industry receive from their trading partners. 1) Extremely Unfair to 7) Extremely Fair	dj2	7.00	5.00	5.02	1.19	0.78

Table 2: Descriptive Statistics for Reflective Measurement Items (continued)

Variable Measures	Item Name	Range	Median	Mean	Std. Dev.	Item Loading
Organizational Distributive Justice (Kumar et al., 1995) (continued) <i>How fair are your organization's outcomes and earnings compared to:</i>						
What this trading partner earns from transactions associated with their relationship with your organization. 1) Extremely Unfair to 7) Extremely Fair	dj3	7.00	5.00	5.06	1.32	0.83
Organizational Relationship Satisfaction (Ganesan, 1994) <i>Describe your organizations feeling with respect to the outcomes with this trading partner.</i>						
Dissatisfied versus Satisfied 1) Very Pleased to 7) Very Displeased	rs1	7.00	6.00	5.13	1.53	0.90

Variable Measures	Item Name	Range	Median	Mean	Std. Dev.	Item Loading
Contented versus Disgusted 1) Very Pleased to 7) Very Displeased	rs2	7.00	6.00	5.16	1.45	0.98
Disagreements 1) Very Pleased to 7) Very Displeased	rs3	7.00	5.00	5.06	1.38	0.72
<i>Trading Partner B2B E-commerce Risk Reflective Scale</i>						
Business Level Risk Factors	blr	6.11 [†]	.01	0.00	1.00	0.88
Application user Level Risk Factors	alr	5.90 [†]	.04	0.00	1.00	0.99
Technical Level Risk Factors	tlr	5.80 [†]	.11	0.00	1.00	0.88

[†] Absolute values

Both reflective and formative measurement techniques were used to derive the B2B e-commerce risk construct (Jarvis et al., 2003). Whether to model a construct as formative or reflective is determined by the nature of the construct and the item measures used. Item measures for reflective constructs are influenced by the underlying latent construct. As such, reflective construct item measures are expected to be internally consistent, and substitutable. Thus, the addition or deletion of an item measure does not change the underlying meaning or nature of the reflective construct. In addition, changes that alter the reflective latent construct are made apparent by changes to the group of related item measures (Jarvis et al., 2003).

Formative latent constructs are derived from the combination of associated and observable formative item measures. As such, formative item measures need not be internally consistent or move in the same direction, as each item measure can make a unique contribution to the latent construct. In addition, the removal of a formative item measure can alter the meaning of the associated latent construct (Jarvis et al., 2003).

The reflective construct trading partner B2B e-commerce risk was based on a two-step process utilizing three lower level formative constructs: business level risk, application user level risk, and technical level risk. In step 1, measurement items from Sutton et al. (2008) were validated and used to estimate the three lower level formative constructs business level risk, application user level risk, and technical level risk. In step 2, the validated formative items were used to generate participant factor scores for business level risk, application user level risk, and technical level risk using principal component analysis (PCA). These PCA participant factor scores were used as reflective item measures for the B2B e-commerce risk reflective construct. This two-step process incorporated both individual B2B e-commerce risk from a specific trading partner and the effects of the organization's universal B2B e-commerce risk policies, procedures, and practices that can influence organizational perceptions of specific trading partner B2B e-commerce risk.

As previously discussed, step 1 evaluates the scale validity of the lower level formative constructs business level risk, application user level risk, and technical level risk. Consistent with prior research, multicollinearity (Diamantopoulos et al., 2008) and outer-item weights (Chin, 1998) were examined to assess formative item measurement

validity. Based on Petter et al. (2007), a conservative variance inflation factor (VIF) of 3.30 was adopted as the maximum allowable for formative measurement item inclusion. VIF scores for one application user level risk item measure and two technical level risk item measures exceeded the 3.30 threshold. These items were eliminated from further analysis. All other formative items were retained.

Components based structural equation modeling was used to assess outer-item weights (Ringle et al., 2005). Prior literature offers mixed guidance concerning the inclusion or exclusion of formative item measures with non-significant item weights. Some (Diamantopoulos and Winklhofer, 2001) recommend removing non-significant item measures for parsimony, while others (Bollen and Lennox, 1991; Diamantopoulos et al., 2008) recommend retaining all item measures to ensure alteration of the meaning of the formative construct does not occur. The latter approach was adopted for use within this study. While retaining formative item measures with non-significant outer-item weights may not contribute significantly to the estimation of the formative construct, this approach ensures the meaning of the formative construct is not altered. In addition, the prior elimination of formative items measure with a VIF of 3.30 or over ensures that the remaining formative measures are not unduly influencing formative construct estimation. Scale item measures, VIF scores, outer-item weights, and associated t-values are presented in Table 3.

Table 3: Descriptive Statistics for Formative Measurement Items

Formative Measures	Item	VIF	Outer-Item Weights	t-value
<i>Business Level Risk Factors</i> (Sutton et al., 2008)				
Understanding by trading partner (TP) of their business processes, where e-commerce fits into those processes, value of business process integration with TPs, and where benefits are derived.	blr1	2.13	-0.01	0.04
Trading partner's ability to assess the use/success of technology and the benefits of B2B implementation/technology investment (including return on investment).	blr2	2.83	0.16	0.66
Trading partner's costs of meeting regulatory requirements and their organization's understanding of associated risks of non-compliance (including inter- and Intra- state compliance issues).	blr3	1.96	0.22	1.12
Trading partner's technical understanding at a level that facilitates creation of a transformational vision for change and the ability to implement successful change management strategies to achieve objectives, gain acceptance, and support sustainability of the change.	blr4	2.40	-0.12	0.47

Trading partner's understanding of the intended functionality of a system at the analysis/requirements stage and tying of the system to business processes that are evolved or engineered accordingly to meet the business objective.	blr5	3.03	-0.01	0.17
Trading partner's level of adherence to contractual requirements including such things as product volume, sales prices, time/service commitments, and settlement (including legal agreements such as non-repudiation and the level of legal binding).	blr6	2.15	0.11	0.43
Trading partner's due diligence in implementing B2B relationships at the business, technology, and security levels to assure users understand data classification/ownership/security when handling partner data and the partner maintains appropriate segregation of data to appropriate users.	blr7	2.58	-0.22	0.93
Trading partner's understanding of risks associated with their projects and accordingly executing effective project management.	blr8	2.47	0.27	1.34
Trading partner's understanding of the technical complexities and associated costs of B2B development, implementation, and maintenance; and the legal ramifications, costs of implementing vs. not implementing non-repudiation agreements, costs of new business rules, and loss of personal marketing contacts.	blr9	2.79	-0.07	0.40

Table 3: Descriptive Statistics for Formative Measurement Items (continued)

Formative Measures	Item	VIF	Outer-Item Weights	t-value
<i>Business Level Risk Factors</i> (Sutton et al., 2008) (continued)				
Trading partner's team expertise for guiding all aspects of B2B e-commerce projects along with training for project teams and users.	blr10	2.79	-0.26	1.25
Trading partner's broad management involvement in IT/business planning while maintaining independence in the selection of technology preferences.	blr11	2.37	0.58	3.14
Trading partner's integration of applications into organizational procedures and guidelines – including comprehensive documentation.	blr12	2.18	-0.30	1.49
Auditability of trading partner's system based on effective monitoring controls and audit trail (history of electronic data, updates, changes).	blr13	1.95	0.35	2.01
Trading partner's ability to protect a distinguished Brand in an e-commerce environment.	blr14	1.76	0.15	0.69
Trading partner's resilience to a business interruption.	blr15	1.72	0.07	0.51

<i>Application user Level Risk Factors</i> (Sutton et al., 2008)				
Appropriate level of training for trading partner's users and related cost constraints	alr1	2.19	-0.01	0.01
Will the target trading partner (TP) use a proposed B2B system (considering such issues of whether there is a champion for the project, sufficient IT sophistication to integrate within TP's systems environment, and ease of use of application)?	alr2	2.20	0.09	0.37
When upgrading systems based on new technologies or business partner request, the trading partner has sufficient coordination and change control procedures in place to maintain reliability and protect transaction validation procedures	alr3	2.38	-0.06	0.23
Trading partner's understanding of and agreement on data structure/scope/business rules for exchange of information	alr4	2.51	-0.40	2.12
Is there benefit of B2B ventures to the trading partner and is the e-business marketplace sustainable?	alr5	2.30	0.02	0.26
Clear and sufficient contract documentation on policies, procedures, connectivity guidelines, limitations, review plan, etc. (Service Level Agreements)	alr6	2.17	0.14	0.67
Application controls in place for completeness, accuracy, and processing integrity (i.e., trading partner's applications function as intended).	alr7 [†]	3.65	N/A	N/A

Table 3: Descriptive Statistics for Formative Measurement Items (continued)

Formative Measures	Item	VIF	Outer-Item Weights	t-value
<i>Application user Level Risk Factors</i> (Sutton et al., 2008) (continued)				
Trading partner's implementation of new B2B applications include testing for assurances on hardware/software capability to support applications, availability of supporting applications 24/7, and performance and capacity of data exchange	alr8	2.83	0.38	1.94
Third party assurance of transaction validity	alr9	1.58	0.08	0.49
Marketing cost to sell the trading partner on a given B2B application	alr10	1.73	0.23	1.13
Privacy of data agreements	alr11	2.04	-0.15	0.76
Alignment of trading partner's business processes with implemented B2B e-business technologies	alr12	2.31	-0.03	0.08
Adequacy of the security over access to trading partner's business application systems	alr13	2.19	0.18	0.80

Inaccurate, inadequate, or outdated documentation on systems software/hardware provided by trading partner	arl14	1.89	0.17	0.73
Trading partner's inability to have an enterprise view of the full range of trading partner relationships	alr15	2.08	0.37	1.87
Technical Level Risk Factors (Sutton et al., 2008)				
Change management processes in place to assure maintenance of security and integrity of systems as technology evolves rapidly.	tlr1	2.18	0.08	0.69
Trading partner's security over all networks and network interactions ensure transmission integrity and provide guaranteed delivery transaction to the correct trading partner.	tlr2	2.79	0.03	0.03
Technology sophistication/expertise differential between trading partners and related selection of appropriate standards and hardware/software by the right people in this trading partner's organization.	tlr3	2.41	-0.05	0.12
Trading partner's maintenance of data accuracy during systems conversion and application usage.	tlr4	2.80	-0.11	0.37
Completeness and accuracy of trading partner's data processing activities.	tlr5	3.09	0.08	0.31
Metrics related to capacity, resiliency, and monitoring in order to better predict/control performance by trading partner.	tlr6	2.09	-0.27	1.32
Security of communication technology (infrastructure) --including vulnerability of ISP and/or public Internet, vulnerability to malicious code (e.g., viruses), security vendors expected survival and the trading partner's general security model.	tlr7	3.00	0.10	0.35

Table 3: Descriptive Statistics for Formative Measurement Items (continued)

Formative Measures	Item	VIF	Outer-Item Weights	t-value
Technical Level Risk Factors (Sutton et al., 2008) (continued)				
Trading partner's vulnerability to loss of availability of data, systems, applications, etc., whether loss is accidental, intentional, or by poor design.	tlr8	2.71	0.19	0.67
Trading partner's setting of appropriate user profiles to assure information is appropriately compartmentalized by information types and classified by access levels.	tlr9	3.17	0.08	0.36
Controls to enforce compliance with regulatory requirements and to enforce regulations	tlr10	2.67	0.03	0.04

Comprehensive access management to applications/operating systems protected via controls (e.g., firewalls) in place to assure confidentiality, availability, and integrity (e.g., unauthorized access).	tlr11 [†]	3.76	N/A	N/A
Channel security through appropriate controls (e.g., encryption implemented according to regulations) including validation and authentication of transaction partner.	tlr12	2.74	0.19	0.78
Ease of transition of information to new B2B systems, ease of integration with trading partner's systems, consistency in methods of partner, and ability to efficiently route B2B transactions to the right internal applications.	tlr13	2.58	0.46	1.76
Flexibility and scalability of the trading partner's system (hardware/software independence).	tlr14	2.78	0.16	0.72
Redundancy and failover of trading partner's systems (in relation to downtime tolerance).	tlr15 [†]	4.10	N/A	N/A
Adequacy of trading partner's disaster recovery plan.	tlr16	2.12	-0.18	0.99
Adequate staff expertise available on an as-needed basis.	tlr17	2.26	-0.24	1.14
Comprehensive systems documentation of trading partner's systems.	tlr18	2.26	0.19	0.83

[†] Items dropped

Step 2 generates individual PCA factor scores for each participant based on the validated business level, application user level, and technical level risk formative item measures retained from step 1. Using PCA with oblique ($\Delta = 0$) rotation, eigenvalues were generated to assess the scale validity of the business level, application user level, and technical level risk formative constructs. Analysis of the eigenvalues indicated that the business level risk formative item measures combined to form a single construct. However, based on the initial eigenvalues, both application user level risk (eigenvalues = 6.98 and 1.11) and technical level risk (eigenvalues = 8.89 and 1.14) formed two constructs (results not tabulated). Given the disparity in the range of eigenvalues for both application user level and technical level risk, parallel analysis was used to generate an eigenvalue cutoff. The results (not tabulated) indicated that eigenvalues greater than 1.34 for application user level risk and 1.39 for technical level risk were necessary to establish the existence of a second unique factor. As the initial eigenvalues for application user level and technical level risk did not exceed this level, the existence of the second factors was deemed spurious. Based on the preceding results, PCA constrained to a single factor, was used to generate participant factor scores for business level risk, application user level risk, and technical level risk. The resulting participant factor scores become the reflective items measures for the B2B e-commerce construct. Scale validity for the B2B e-commerce construct was evaluated using principal axis factoring. The business level risk, application user level risk, and technical level risk reflective item measures all loaded on the B2B e-commerce risk construct at a minimum of 0.70 (Hair et al., 2010) indicating acceptable scale validity.

4. Results

Covariance based structural equation modeling (SEM) was used to evaluate overall measurement model fit and assess the measurement validity of the latent constructs prior to testing the structural model (Hair et al., 2010). Inter-construct correlations, average variance extracted (AVE), square root of AVE, composite reliability scores, and inter-construct correlations for all reflective latent constructs are reported in Table 4. Examination of the inter-construct correlations indicated none were above the standard threshold of 0.85 (Kline, 2005). In addition, the square root of all AVE exceeded the highest inter-construct correlation (Chin, 1998). Based on these results, the latent constructs exhibited acceptable discriminant validity. Latent construct convergent validity was assessed using composite reliability scores and AVE. The results indicated the composite reliability scores of all constructs exceeded 0.70 (Nunnally and Bernstein, 1994). All AVE were higher than 0.50 (Chin, 1998). These results support the convergent validity of the latent constructs (Chin, 1998; Fornell and Larcker, 1981). The chi-square statistic ($\chi^2 = 170.94$, $df = 118$, $p = 0.001$), root mean squared error of approximation (RMSEA = 0.05, LO = .03, HI = .06), Tucker Lewis Index (TLI = 0.98), and comparative fit index (CFI = 0.98) were used to evaluate overall measurement model fit (results not tabulated). These results suggest an acceptable degree of measurement model fit to the underlying data (Hair et al., 2010).

As with all perceptual data obtained from a single survey completed by an individual respondent, common method bias is a concern (Burton-Jones, 2009). The unmeasured latent factor method approach (Podsakoff et al., 2003) was used to evaluate if sufficient common method variance exists to detrimentally influence parameter estimates within the measurement model (results not tabulated). All measurement items loaded significantly on their associated latent constructs. In contrast, the highest measurement item loading on the unmeasured latent construct was 0.11 and not significant ($p > .10$). Thus common method bias does not appear to be of concern within this study.

Table 4: Measurement Model Construct Validity and Composite Reliability

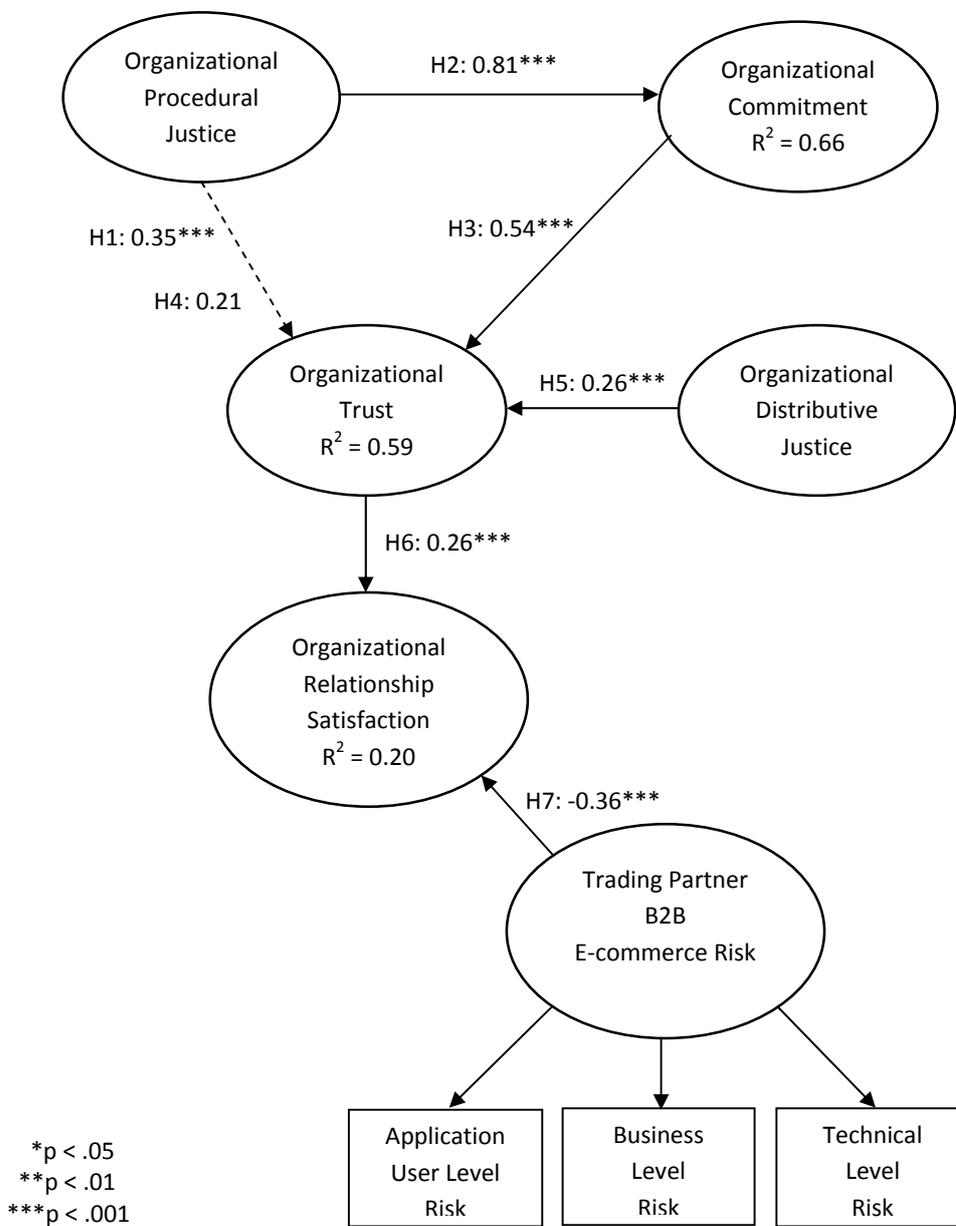
	Organizational Procedural Justice	Organizational Distributive Justice	Trading Partner B2B E-Commerce Risk	Organizational Trust	Organizational Commitment	Organizational Relationship Satisfaction
Average Variance Extracted [†] , Square Root of Average Variance Extracted ^{††} , and Inter-Construct Correlations ^{†††}						
Organizational Procedural Justice	0.76 0.87					

Organizational Distributive Justice	0.43	0.74 0.86				
Trading Partner B2B E-Commerce Risk	0.07	0.12	0.84 0.92			
Organizational Trust	0.71	0.52	0.19	0.71 0.84		
Organizational Commitment	0.79	0.39	0.11	0.74	0.68 0.82	
Organizational Relationship Satisfaction	0.10	0.20	-0.32	0.21	0.18	0.76 0.87
Composite Reliability						
	0.91	0.89	0.94	0.88	0.86	0.90

† AVE is the upper number on the diagonal
 †† The square root of AVE is the lower number on the diagonal
 ††† Inter-construct correlations are below the diagonal

The structural model with path loadings and significance levels for the hypothesized relationships is presented in Figure 2. The chi-square statistic ($\chi^2 = 228.20$, $df = 129$, $p < .001$), root mean squared error of approximation (RMSEA = 0.06, LO = 0.05, HI = 0.07), Tucker Lewis Index (TLI = 0.96), and comparative fit index (CFI=0.97) were used to evaluate the overall fit of the structural model. The results suggest strong structural model fit to the underlying data (Hair et al., 2010). Examination of the path loadings indicated all hypothesized relationships were significant in the predicted direction at a minimum of $p < .001$, with the exception of the mediated relationship between procedural justice and trust. An examination of the non-significant procedural justice to trust path indicated full mediation of the procedural justice to trust relationship through commitment. The overall strength of the structural model provides strong support for RVF and the direct influences of trust and risk on relationship satisfaction. In addition, the structural model results support the indirect effects of justice and commitment that enhance trust and, ultimately, relationship satisfaction.

Figure 2: Structural Model



$\chi^2 = 228.20$, $df = 129$, $p < .001$
 TLI = 0.96
 CFI = 0.97
 RMSEA = 0.06, LO = 0.05, HI = 0.07

Hypothesis 1 predicts that higher levels of procedural justice within the trading partnership will be positively associated with organizational trust in the trading partner. Because of limitations in the SEM software used to estimate the mediated relationships within the structural model, the results for Hypothesis 1 are obtained by estimating the structural model without the path from procedural justice to commitment. All other paths within the structural model remain intact. This approach provides an unbiased estimate of the direct effect of procedural justice on trust. The results indicate that higher levels of procedural justice are positively associated (0.35, $p < .001$) with organizational trust of the trading partner. Thus, procedural justice serves as a form of effective governance by reducing the need for formal contracts and control mechanisms that inhibit the development of trust.

The effects of procedural justice on commitment are addressed in Hypothesis 2. As predicted, higher levels of procedural justice within the trading partnership are positively associated (0.81, $p < .001$) with high levels of organizational commitment to the trading partnership. In addition, the results indicate that procedural justice accounts for 66 percent of the variance in commitment. This supports the contention that relational norms and behaviors developed between trading partners signal the desire to maintain partnership ties.

Hypothesis 3 is concerned with the impact of commitment on trust. Specifically, high levels of organizational commitment are positively associated with high levels of trust. Support for this relationship is provided by the positive association (0.54, $p < .001$) between high levels of organizational commitment and organizational trust of the trading partner. Asset specific investments and the development of behavioral norms signal the desire to form and maintain long-term mutually beneficial trading partnerships which are necessary for trust to deepen.

Hypothesis 4 predicts that the direct association between higher levels of procedural justice within the trading partnership and organizational trust of the trading partner will be mediated by the procedural justice-commitment-trust relationship. The results (not tabulated), estimated using the bias corrected percentile method, indicate the total effect of all structural paths from procedural justice to trust is 0.65 and significant at the $p < .001$ level. Analysis of the indirect effects of the structural paths from procedural justice through commitment to trust indicate much (0.44, $p < .001$) of the influence of procedural justice on trust flows through commitment (results not tabulated). This indirect effect suppresses the direct effect (0.21, $p > .05$) between procedural justice and trust. Thus, organizational commitment to the trading partner fully mediates the relationship between procedural justice in the trading relationship and organizational trust in the trading partner.

The influence of distributive justice on trust is examined in Hypothesis 5. Specifically, hypothesis 5 predicts that higher levels of organizational distributive justice will be positively associated with higher levels of organizational trust in the trading partner. The model results indicate support for this prediction. Distributive justice is positively associated (0.26, $p < .001$) with higher levels of trust. The rewards, both financial and non-financial, from interactions between organizations and their trading partners are beneficial to trust in the trading partner. In addition, the combined effects of justice and commitment account for 59 percent of the variance in trust.

Hypothesis 6 examines the relationship between higher levels of organizational trust in the trading partner and higher levels of organizational relationship satisfaction. The results support this proposed relationship. Higher levels of trust are positively associated (0.26, $p < .001$) with higher levels of relationship satisfaction. Thus, trust is instrumental in building and maintaining the level of satisfaction necessary to ensure long-term trading partnerships capable of producing sustainable competitive advantage.

Trust serves as a nexus to collect and channel the effects of procedural justice, distributive justice, and commitment perceptions on relationship satisfaction; however, justice perceptions and commitment can also enhance relationship satisfaction indirectly. The results (not tabulated), estimated using the bias corrected percentile method, demonstrate the positive indirect effects of the structural paths from procedural justice (0.17, $p < .001$), commitment (0.14, $p < .001$), and distributive justice (0.07, $p < .001$) to relationship satisfaction. Interestingly, distributive justice has the least indirect effect on relationship satisfaction. This suggests that, relative to the input-output ratio (i.e., distributive justice), organizations and their trading partners view the processes that encourage the development of relational norms of expected behavior (i.e., procedural justice), and demonstrate long-term orientation through investments in relation specific assets or business process training (i.e., commitment), as critical to building and maintaining relationship satisfaction.

Finally, Hypothesis 7 predicts that organizational perceptions of B2B e-commerce risk will be negatively associated with organizational relationship satisfaction. The structural model results support this hypothesis. A negative association (-0.36, $p < .001$) exists between perceptions of trading partner B2B e-commerce risk and relationship satisfaction. The highly integrated and tightly coupled information systems necessary for organizations to achieve sustainable competitive advantage from relationships with their trading partner also expose the organization to risk from the trading partnership. In addition, the combined effects of trust and risk explain 20 percent of the variance in relationship satisfaction.

5. Discussion

This study examines the influence of trust and risk on relationship satisfaction within the context of B2B e-commerce trading partnerships. The impacts of procedural justice, distributive justice, and commitment on trust are also analyzed. All hypotheses are significant in the predicted direction and the research model exhibits strong fit to the underlying data.

The results show that organizational trust in the trading partner is positively associated with an organization's satisfaction with the trading relationship; however, this

effect is counter balanced by the greater and negative association of trading partner B2B e-commerce risk on relationship satisfaction. The results also support the effects of the hypothesized antecedents to trust. Higher levels of interorganizational procedural justice, organizational perceptions of distributive justice, and organizational commitment to the trading partner are all positively associated with organizational trust in the trading partner. As hypothesized, the relationship between procedural justice and trust is mediated by commitment.

Overall, the results presented in this paper support the RVF. Organizations can attain sustainable competitive advantage through participation in interorganizational relationships, such as B2B e-commerce trading partnerships. To do so, high levels of procedural justice, distributive justice, and commitment must exist within the trading partnership to engender the level of trust necessary to produce relationship satisfaction—a critical component to long-term trading partnerships capable of creating, maintaining, and enhancing relation specific assets, complementary resources and capabilities, effective governance procedures, and knowledge sharing routines. However, the advantages derived from the trading partnerships expose organizations to risks that can erode relationship satisfaction and hinder the achievement of sustainable competitive advantage.

The research presented in this paper contributes to three areas of concern within the broad context of interorganizational relationship literature. First, researchers have noted the need to consider the effects of risk, in addition to trust, within the environment of interorganizational relationships (Miller et al., 2008). The results on risk indicate it is an important deterrent to the achievement of relationship satisfaction despite the existence of trust. This finding lends support to the emerging view that trust and risk are distinct, but interrelated constructs that exist simultaneously within the interorganizational relationship setting of B2B e-commerce trading partnerships. This finding is of key importance, as declining levels of relationship satisfaction hinder the development of the interorganizational resources necessary to achieve sustainable competitive advantage. Second, this study contributes to the growing stream of research investigating interorganizational perceptions of procedural and distributive justice and the influence of these justice perceptions on interorganizational relationships (Luo, 2005; Luo, 2007; Brown et al., 2006; Beugre and Acar, 2008). The direct and indirect effects of procedural and distributive justice on commitment, trust, and relationship satisfaction support the conceptualization of justice perceptions as interorganizational construct that have significant influence on trading partnerships and relationship satisfaction. Finally, by examining the use of B2B e-commerce trading partnerships, this study addresses the need to consider the impact of information technology on interorganizational relationships (Cuganesan and Lee, 2006; Granland, 2011).

As in all studies, several limitations should be considered when evaluating the results and framing future research. First, data collected for this study is cross-sectional. Thus, how justice perceptions, commitment, trust, and risk develop and change over time and the implications for relationship satisfaction are not specifically addressed. However, to the extent that perceptions of justice, commitment, trust, risk, and relationship satisfaction are based on the culmination of prior experiences and represent beliefs about future performance, the measures used incorporate a

longitudinal dimension. Further exploration of how the antecedents to relationship satisfaction develop and evolve over time would aid in understanding the complexities of interorganizational relationships.

Second, the research model tested does not consider the existence of feedback mechanisms that may exist between the constructs. For example, increased levels of commitment may plausibly influence trust which in turn increases commitment. If these cyclical relationships exist, knowledge of the interplay would be beneficial to understanding how trading partnerships transition from transaction based to relational.

Third, the B2B e-commerce risk measure, while comprehensive, does not directly distinguish between risks to relationship dynamics and performance risks (Das and Teng, 2001). Further research on this distinction and its impact on relationship satisfaction could guide the development of appropriate risk identification and mitigation efforts.

Finally, and related to the preceding point, this research study does not consider the effects of controls on risk. Research within the management control systems stream suggests that controlling risk will enhance trust by providing reassurance that trust has been well placed (Das and Teng, 2001; Colletti et al., 2005, Caglio and Ditillo, 2008, Dekker, 2004; Dekker, 2008). However, what form these controls should take, how they should be implemented, and how they might affect relationship satisfaction is not clear. Increased control contradicts a key principle of RVF—the need for effective governance structures based on relational norms of behavior. Thus, the implementation of inappropriate or excessive performance measures and controls may erode relationship satisfaction and undermine the trading partnership (Mahama and Chua, 2011). Future research should consider how various forms of control, such as assurance over a trading partner's B2B e-commerce systems, will impact relationship satisfaction.

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