

MANAGING RISK IN INTERORGANIZATIONAL RELATIONSHIPS: FACTORS INFLUENCING THE DESIRABILITY OF E-COMMERCE ASSURANCE

Abstract

This study examines the impact of business-to-business (B2B) e-commerce risk, trust in a trading partner, commitment to the trading partner, and differentials in the relative power in a trading relationship, on the desirability of additional governance structures within the managerial control system that improve the level and quality of information about that trading partner (e.g. B2B e-commerce assurance). These relationships are examined through the resource-advantage theory of competition which posits that trading partners are motivated to exhibit constrained self-interest seeking behavior and to place importance on strengthening the efficiency and effectiveness of the relationship as a means of maximizing the trading partners own competitive advantage. However, resource-advantage theory also recognizes that an organization has only imperfect information that is costly to acquire as to the trading partners actual constraint of self-interest and actual focus on enhancing the relationship. In focusing on the role of relationship building, we expand the literature on managerial control systems within interorganizational relationships by addressing three contemporary concerns in the literature: (1) the minimal consideration of the impact of information technology in these relationships, (2) the minimal consideration of the impact of variances in the relative power of the trading partners in the relationship, and (3) the need to consider the dual influences of risk and trust. Data were collected from a broad range of professionals representing a wide cross-section of industries. The 210 respondents enable the evaluation of an overarching model consisting of antecedents to power and commitment (e.g. dependence and core technical competence), the impact of power and commitment on assurance desirability, and the mediating effect of B2B e-commerce risk and trust in a trading partner. The results are strong with all hypotheses supported, strong explanatory power in the model, and strong support for the underlying theory behind the study.

Keywords: Interorganizational relationships, resource advantage theory of competition, comparative advantage theory of competition, B2B e-commerce, IS assurance, e-commerce assurance, managerial control systems, risk management, trust, power, commitment

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I. INTRODUCTION

Interorganizational trading partnerships that transcend traditional boundaries of control and require the coordination of two or more independent entities has radically impacted the design of contemporary managerial control systems (MCS). Such alliances are nested within large and complex networks of interorganizational relationships that many no longer view as optional, but rather see as a necessity to maintaining competitiveness (Chua and Mahama 2007). Corporate competitiveness has moved from an organization centric view to an extended enterprise view where firms participate in end-product networks competing directly with other end-product networks, and the individual organization's success or failure is dependent on the success or failure of the networks in which it participates (Chapman and Corso 2005; Sutton 2006; Hunt and Davis 2008). The result is ever increasing pressure to accelerate business processes and reduce the latency between decisions and outcomes/consequences (Vasarhelyi and Alles 2008). Yet, with a growing body of evidence of high failure rates within these arrangements, the need to assess governance structures that reduce risk levels is high (Das and Teng 2001; Langfield-Smith and Smith 2003; Dekker 2004).

In this study, we examine the integrative effects of risk and trust on the desirability of assurance over a trading partner's e-business processes. While a rich literature is evolving in the area of MCS for interorganizational relationships, researchers have noted the need to pay more attention to risks rather than just trust (Miller et al 2008), to acknowledge and consider the critical role of IT in interorganizational relationships (Cuganesan and Lee 2006), and to focus on the impacts of unequal power in such relationships on the governance structures that may be most appropriate (Caker 2008). Our research specifically addresses these issues as we consider

the mediating effects of risk and trust on the nature of interorganizational relationships and the preference for the use of a high information governance structure—i.e. assurance over a trading partner's e-business capabilities and systems. We directly consider the nature of the underlying relationship in terms of power over the trading partner and commitment to the trading relationship. Antecedents to the establishment of power and commitment are also considered with a particular focus on the dependence of the trading partner on the trading relationship and the core IT competencies of the trading partner.

The focus on e-business capabilities is critical as these capabilities are at the core of virtually all interorganizational relationships in the contemporary business environment. To thrive in contemporary interorganizational relationships, the IT function must have the technologies in place to participate, back office enterprise systems need to be linked with e-commerce communications, and business processes need to be aligned with the e-business strategy (Straub and Watson 2001). In terms of relationship building as a means of developing a resource for long-term competitive advantage, the likelihood of a sustainable relationship-based advantage is high when information systems are linked and organizational and informational resources are shared (Morgan and Hunt 1999) However, in an analysis of a large number of small- and medium-sized enterprises that served almost exclusively as suppliers to a single major retailer, Khazanchi and Sutton (2001) found that most were using their e-commerce linkages essentially as fax machines; and, the underlying systems and business processes were not aligned with the business model being pushed by the major retailer. Similarly, Anderson and Lanen (2002) found that while EDI usage sped transaction delivery and processing, they found no evidence of changes in back office processes and perceived that a lack of partner training on interorganizational systems led to the high error rates that were observed. Ernst and Young

(2004) also raised similar concerns in a recent survey report where the firm noted that enterprises can outsource the processes but they cannot outsource the risks associated with work stoppages and supply chain disruptions, nor the responsibility for controls over the information flowing across the supply chains into financial statements.

There is some evidence in the literature that managers are aware of the associated risks and, under certain circumstances, would desire control systems that would help mitigate the risk. In a case study, Langfield-Smith and Smith (2003) found that the company under study specifically evaluated the technical competence of a potential vendor as a means of establishing competency trust. Boritz and Hunton (2002) experimentally demonstrate that managers are more willing to recommend a partner when assurance as to the partner's systems reliability is provided. Similar results by Mauldin et al (2006) find that such reliability assurance is valued more when it covers systems in general as opposed to just the reliability of transaction information. Gendron and Barrett (2004) find that attempts by the accounting profession to launch assurance certification programs for e-commerce have evolved to the establishment of principles and criteria for providing specific business-to-business (B2B) e-commerce assurance and advice. Bedard et al. (2005) report on one specific firm's provision of such services as verification that reliability assurance is feasible. Bedard et al. (2005) suggest that such services may increase in demand in light of the current regulatory focus on enterprise risk management and that trading partners could improve their marketability through certification of their e-business processes.

The purpose of our study is to examine e-business assurance in the context of an available governance structure for improving trust and mitigating risk within an interorganizational relationship. The resource-advantage theory of competition provides a

foundation for understanding how interorganizational relationships evolve, when information on a trading partner's behavior is desirable and why a trading partner might be motivated to support the relationship even if it requires loss of control due to imbalances in power (Hunt 1997a; Morgan and Hunt 1999; Hunt and Davis 2008). We focus on the structural relationships between the trading partners in order to understand the conditions that would drive the desirability of such assurances. Accordingly, we focus on organizations that maintain interorganizational relationships with trading partners, conduct repeated transactions over time with such trading partners, and process related transactions using B2B e-commerce. These criteria are important as long-term relationships form dependencies and commitments, which are viewed as instrumental to the selection of and investment in governance structures (Tomkins 2001; Morgan and Hunt 1999; Hunt and Davis 2008; Vosselman et al. 2009). Data were collected from 210 experienced B2B e-commerce professionals (i.e. CIOs, IT Auditors, IS Security staff, and B2B E-commerce managers). Respondents were asked a series of questions related to their own organization, a key trading partner, and the trading relationship between the two.

The results of this study are important to the evolution of the MCS research on interorganizational systems. First, we directly address the impact of B2B e-commerce risk on the desirability of a high information governance structure. This focus on B2B e-commerce considers the multi-dimensions of associated risks: technical level concerns, application level concerns, and business level concerns (Sutton et al. 2008). Second, we examine the joint impacts of trust and risk on the desirability of B2B e-commerce assurance. Recent research has increasingly suggested that trust and risk should be considered and that these control structures are not replacements for each other, but rather that trust leads to greater investment in governance structures that can verify the basis for that trust (Dekker 2004; Nicolaou and

McKnight 2006; Dekker 2008; Vosselman et al. 2009). Third, we consider the relationship structures that dictate the resulting decision choices by considering the important roles of power (Caker 2008) and commitment (Tomkins 2001) in establishing the desirability of additional governance structures. These results have implications for organizations in both the formative stages and maturation of an interorganizational relationship.

The remainder of the paper is presented as follows. Section II provides an overview of the theory, coverage of the relevant background literature, and the formulation of the hypotheses and the research model. Section III presents the research methods and Section IV documents the results of the study. Section V provides conclusions and implications.

II. THEORY, BACKGROUND AND HYPOTHESES

The theoretical foundations for this study are derived from the emerging body of research supporting the applicability of the Resource-Advantage Theory of Competition¹ (R-A theory) in understanding interorganizational relationships (Hunt 1995; Hunt and Morgan 1995; Hunt 1997c; 2000). R-A theory focuses on the judicious use of valuable firm resources to achieve superior financial performance. This differs from neoclassical economic perspective that treats success as the maximization of wealth and assumes perfect information is available. Rather, R-A theory adopts a fundamental assumption that information about customers, competitors, suppliers and production techniques is both imperfect and costly to obtain (Hunt 1997c). Successful organizations instead focus on developing comparative advantage through available resources that are unique. This, in turn, allows the organization to achieve superior financial performance through either more efficient production or more effective production—or ideally through more efficient production that leads also to more effective production (Hunt 1997c; 1999).

¹ Also referred to as Comparative Advantage Theory of Competition in its early gestations (e.g. Hunt and Morgan 1995).

In developing relationships with trading partners, this fundamental difference in theoretical perspective has significant ramifications for how such relationships are viewed. Research traditionally has viewed trading relationships and alliances through Transaction Cost Economics (TCE) theory or Resource Dependence theory (Morgan and Hunt 1999; Dekker 2004). Such neoclassical economic theories assume all human behavior is motivated by self-interest or utility maximization and, accordingly, all humans will inevitably engage in opportunism (Williamson 1975). Hence, rational organizations will choose efficient organizational forms of governance structures for transactions (Williamson 1979) and the governance structures yielding the lowest transaction costs will be pursued (Dekker 2004). R-A theory acknowledges the importance of the pursuit of self-interest by humans, but posits that such behavior is often motivated by *constrained* self-interest seeking (Hunt 1997c).

This behavioral perspective is critical as organizations develop trading relationships. Trading relationships, like many other types of resources that a firm may possess, must be selected carefully and groomed over time in order to develop a strategic portfolio of relationships (Hunt 1997a). Not all potential relationships are ultimately important to a firm, and the development of strong, long-term relationships can be costly (Hunt 1997). Given the high exit costs associated with breaking off tight relationships, such relationships should be restricted to those that provide a resource that is a source of competitive advantage (Morgan and Hunt 1999) and where the partner behaves in a manner suggesting they are trustworthy (Morgan and Hunt 1994).

The development of a transaction-based trading partner into a key relational partner is an evolutionary process that should be allowed time to evolve (Hunt and Morgan 1994). Frequently in such trading relationships, one organization will be dominant and the other will be dependent,

leading to the dominant firm being perceived as having power and control (Morgan and Hunt 1999). Researchers from the resource dependence theory perspective posit that organizations will avoid being controlled in exchange relations and that an organization's aversion to entering such an interorganizational relationship will be directly related to the perceived loss of autonomy. Thus, organizations will enter such relationships cautiously as they view these relationships as a liability and fear participating in them will require relinquishment of power (Morgan and Hunt 1999). However, direct tests of the underlying theory have failed to find support for such an aversion (Oliver 1991).

Morgan and Hunt (1999, 282) counter that trading partners enter into such relationships "not reluctantly but optimistically." Alternatively, they theorize that such relationships can make an organization more competitive, yield greater access to valuable resources, and offer the best means by which to access such resources.² Treating such relationships as strategic assumes the available resources are used efficiently, are complex, and are maintained and protected to ensure ongoing availability (Bharadwaj et al. 1993; Hunt and Morgan 1995; 1999). Access to these resources rarely, if ever, comes without a cost. The trading partner must provide a certain level of asset specificity in an efficient and effective manner for the relationships to survive; thus, the trading partner will also make investments, but only when such investments support and foster a long-term, strategic trading relationship (Chen et al. 2004; Hunt and Davis 2008). Trading partners often make short-term sacrifices in order to preserve profitable long-term relationships with the more powerful firm (Hunt and Davis 2008). Nonetheless, such an interorganizational relationship creates a substantial dependence and transfer of power in the relationship (Emerson 1962; Son et al. 2005).

² Morgan and Hunt (1999) view this as a fundamental difference between R-A theory and Transaction Cost Economics theory/Resource-Dependence theory.

Power is arguably still important as it can be the most direct driver of a relationship and enables the more powerful partner to determine the agenda and protocols for the interorganizational relationship (Dekker 2003; Seal et al. 2004; Caker 2008). However, judicial use of that power is most likely to facilitate a resource advantage based on the premises of R-A theory. Such judicial use will foster the relationship with the trading partner and help sustain a longer-term relationship when such a relationship is viewed as a potential resource of value. But, R-A theory also posits that the development of a long-term relationship-based resource is premised on the trading partner maintaining *constrained* self-interest, seeking behavior that values the relationship over the long-term (Hunt 1997a). Given the premise of R-A theory that information on customers, suppliers and alliance partners is imperfect and very costly to attain; the more powerful partner remains under a certain veil of ignorance as to the actual behavior of the weaker partner (Hunt 1997c).

Accentuating this void of information are the conditions under which such relationships are most valuable and most likely to be sustainable over the long-term. Long-term relationships generating a valuable resource advantage are perceived to be most sustainable when they arise from organizational, informational or relational resources (Morgan and Hunt 1999).

Organizational resources consist of proprietary technologies that are often gained through organizational learning. Informational resources on their face have a highly perishable life when considering the information itself; however, the systems that gather, use and disseminate information have a much longer life. Such informational resources frequently include technologies that facilitate tight electronic coupling of the organizations IT systems. While an organization may interact and benefit from a trading partner's organizational and informational

resources, the organization has little opportunity to aggregate information on the depth of integration and sustainability of such resources within the partner firm.

Relational resources are most valuable when associated with trust, commitment and loyalty (Morgan and Hunt 1999). Trust and commitment do not evolve quickly, and must be developed over time based on experience with the trading partner (Hunt and Morgan 1994). Both are considered critical to long-term relationships that are sustainable and generate a resource advantage (Morgan and Hunt 1994). Relationship commitment arises when an organization believes that a relationship warrants maximum effort to maintaining that relationship (Morgan and Hunt 1994). Trust exists when an organization has confidence that a trading partner is reliable and participates in the relationship with integrity (Morgan and Hunt 1994). Accordingly, trust is instrumental to commitment; and, in the presence of commitment to a trading partner, the existence of trust is the conduit through which an organization is willing to pursue stronger relationships with that trading partner (Morgan and Hunt 1994). However, in the absence of perfect information, the organization lacks certainty as to the justifiability of placing such trust in the trading partner and likewise creates a risk in the formation of a strong commitment.

E-commerce assurance is a mechanism for alleviating risks that come from imperfect information in trading partner relationships (Khazanchi and Sutton 2001). One of the assumptions inherent in e-commerce assurance³ is a focus on trading partners that are more deeply integrated at the organizational and informational resource level—the types of relationships perceived to be most sustainable over time in terms of providing a resource advantage (Morgan and Hunt 1999). Such assurance provides better information for assessing

³ Instrumental to this perception is the use of E-Commerce Assurance as put forth by Khazanchi and Sutton (2001) which includes consideration of not only the technical levels of integration but the knowledge of users, strength of application systems, and strategic understanding of e-commerce potential at the business level.

the reasonableness of both trust in and commitment to a trading partner. This is reflected in the research model presented in Figure 1. In the following subsections, we look more specifically at individual hypotheses in the model. Key to this model is our focus on an organization's view of its relationship with a selected trading partner. Thus, we will use the terms "organization" and "trading partner" to refer to the two entities respectively.

[Insert Figure 1 about here]

Establishing and Using Power

Dependence is the extent to which one trading partner is reliant on the second partner and the relationship generates rewards and benefits that cannot be easily garnered through alternative available relationships (Kumar et al. 1998; Morgan and Hunt 1999). Relative dependence is considered the primary determinant of power in an interorganizational relationship (Emerson 1962; Hart and Saunders 1997; Son et al. 2005). Such an imbalance in power is common in interorganizational relationships (Caker 2008). Accordingly, the first hypothesis is stated as:

H₁: As a trading partner's dependence increases, the organization's power in the trading relationship will increase.

A power advantage position allows for greater influence in putting governance structures in place (Karahannas and Jones 1999; Mouritsen and Thrane 2006; Emsley and Kidon 2007). However, if the trading partner sees the governance structure as necessary to maintaining the relationship, but not as having any personal efficiency gains attached, then the partner may behave in a manner counter to the intent of the structures (Caker 2008). The trading partner may view such governance structures as self-interested behavior on the part of the organization and be less inclined to act in a *constrained* self-interest seeking mode (Hunt 1997c). In such situations, greater exchange of information could actually put the more powerful organization at risk should

the trading partner fail to have appropriate safeguards in place (Kulp 2002). The interconnectedness of partner company intranets that commonly occur in interorganizational relationships leaves an organization vulnerable to viruses, security intrusions and other cyber attacks if the trading partner has inadequate security in place (Vasarhelyi and Greenstein 2003). Even in the presence of strict contracts intended to mitigate risks, partners can fail to live up to the requirements of those contracts (Anderson and Dekker 2005).

Alternatively, the trading partner may simply fail to integrate processes at a level expected that creates concerns further down the line as to ability to perform as needed across the supply chain. Frequently in such relationships the trading partner faces significant investment requirements to place itself in the position of providing resource advantage in a relationship (Chen et al. 2004; Hunt and Davis 2008) and may even face short-term losses in order to achieve long-term comparative advantage (Hunt and Davis 2008). As noted earlier, Khazanchi and Sutton (2001) found little integration among a large sample of small- and medium-sized enterprises that were connected electronically in supply chains. Rather, orders were received electronically and printed out; thus the print outs drove manual based processes. Anderson and Lanen (2002) similarly did not observe any evidence of widespread integration of EDI connections with back office activities. While performance requirements might be adhered to in the short-term, the lack of integration could affect long-term interests in further cutting cycle times throughout the supply chain and likewise affecting competitiveness (Khazanchi and Sutton 2001; Nicolaou 2008). Such capacity limitations affect not only the supplier, but also upstream supply chain partners (Tomkins 2001).

The use of power to force processes on a dependent trading partner may not always result in the desired outcome. This allows for the possibility that e-commerce risk could actually

increase in situations where there is a power imbalance and potentially a lack of collaboration on strategic deployments. This leads to the second hypothesis:

H₂: As an organization's power over a trading partner increases, the level of B2B e-commerce risk for that partner will also tend to increase.

If an organization perceives that substantial B2B e-commerce risk is evolving from a trading partner, then the organization is more likely to seek a governance structure that could help mitigate that risk. Such supplier uncertainty creates an unpredictability that can affect the organization's on-going activities (Son et al. 2005). Son et al. note that an organization operating in a B2B e-commerce environment should make a great effort to minimize the level of uncertainty that it faces in future trading activities. This is consistent with R-A theory where information is considered imperfect and costly to attain (Hunt 1997c). One form of governance structure that could help reduce uncertainty is B2B e-commerce assurance over the trading partner's systems reliability, applications, users, and business level practices. This leads to the third hypothesis:

H₃: An organization will be more likely to desire assurance over a trading partner's B2B processes if the relationship increases the level of perceived B2B e-commerce risk.

Faced with the potential risks from entering into a B2B e-commerce relationship with a trading partner, an organization in a power advantage position would be likely to pursue a mitigating governance structure. Prior research has found that the assurance process yields higher quality systems and processes, although it is uncertain whether the quality was derived from the assurance, or those pursuing assurance have quality (Jamal et al. 2002). Nonetheless, while a part of the desire for assurance is likely to be affected by the perceived level of risk, the potential for self-interest seeking behavior by the trading partner in reaction to processes

implemented via the power advantage will also provide motivation to implement an assurance process. That leads to the fourth hypothesis:

H_{4a}: As the power of an organization increases within an interorganizational relationship, the desire for assurance over a trading partner's B2B processes will increase.

H_{4b}: The impact of power over a trading partner on B2B assurance desirability is mediated by the level of B2B e-commerce risk.

Thus, one source of assurance desirability comes from the power advantage position and an organization's ability to push control structures onto the trading partner. However, this desirability for assurance can also occur through a desire for verification in a committed relationship even in the presence of trust.

Commit, Trust, but Verify

Commitment is the strong desire to maintain a valued relationship (Moorman et al. 1992). Committed relationships are based on the confidence that the relationship will endure as a result of joint efforts and sacrifices (Boyle et al. 1992). Commitment is a central tenet to all relational exchanges between firms (Morgan and Hunt 1994). As the commitment process develops, an organization must assess both the resulting vulnerabilities and the dependency of the trading partner (Free 2008).

Dependency provides a certain level of commitment by the trading partner as the relationship yields greater returns than any other alternatives the trading partner has available (Morgan and Hunt 1999). For the organization on the other side of the relationship, holding the power position provides some assurance that the trading partner will adhere to both implicit and explicit contractual agreements in order to maintain the relationship. If the partner is viewed as supplying a resource that provides comparative advantage, the more powerful organization

should leverage this dependency and commit to a longer-term relationship if it helps the trading partner link into trading systems and join the supply chain network. This leads to the fifth hypothesis:

H₅: As the level of trading partner's dependence increases, the organization will be more likely to commit to the trading relationship.

The underlying potential for resource advantage that drives commitment is also based on the competency of the trading partner. Before committing to even the early stages of a trading relationship, an organization will assess the potential trading partner's ability to fulfill their end of the commitment (Emsley and Kidon 2007). If a potential partner is not perceived as likely to be competent and reliable, an organization is not likely to enter into a long-term relationship (Nicolaou and McKnight 2006). The level of competency may be negotiable, but perceptions of high ability and expertise would be desired (Langfield-Smith and Smith 2003). Absent a good feel for the trading partner, information sharing is hard to initiate and the organization should be reluctant to share and to commit to a trading relationship absent a certain comfort zone (Kulp 2002). Thus, competence is a key precursor to commitment; and, in the case of interorganizational systems, this is in large part exemplified by IT competence. This leads to the sixth hypothesis:

H₆: As the perception of core technical competence of the trading partner increases, the organization's commitment to the relationship will increase.

Commitment is the foundation for an interorganizational relationship to develop and become static. Long term experiences impact the social construction of the relationship between the trading partner and the organization based on perceptions of fairness, professionalism, and appropriate behavior (Chua and Mahama 2007). As long term commitment is developed, the

organization should examine the relationship in comparison to other possible trading partners (Tomkins 2001). A fundamental part of commitment is the long-term perspective, which is a precursor to developing trust (Free 2008). The memories of past events and changes in the relationship will affect the stability and perceived fairness of the relationship (Chua and Mahama 2007), and ultimately these interactions during the commitment phase will shape the form and nature of the trust in the relationship (Free 2008).

Hart and Saunders (1998) provided a test of the relationship between commitment and trust. Their results were consistent with prior results indicating the greater the commitment of a trading partner in a B2B e-commerce relationship, the more that trust will evolve in the relationship. This leads to the seventh hypothesis:

H₇: As an organization's commitment to a trading partner increases, trust in the trading partner will also increase.

Prior literature has revealed controversy over whether managerial controls reduce trust or grow trust (Langfield-Smith and Smith 2003; Mellewigt et al. 2007; Vosselman et al. 2009). Coletti et al. (2005) suggest that research showing a deterioration effect is backwards—controls are important to trust building. Coletti et al. find that firms will build a stronger control system when possible than researchers have previously believed. Similarly, Velez et al. (2008) find in a longitudinal study that high trust provides a platform where success encourages partners to cooperate more and in turn leads to higher integration of MCS.

The trust-control relationship is actually fundamental to the concept of building alliances. Termed, "Trust but Verify", this concept has often been used in establishing political alliances between countries where the balance of power was skewed in a given direction, but the

relationship was viewed as mutually beneficial. This development of mutual trust is important in the development of an interorganizational relationship (Morgan and Hunt 1999; Son et al. 2005).

MCS researchers have recently begun to evolve in this direction. Dekker (2004) notes that formal control mechanisms may actually enhance a trusting relationship by narrowing the domain and severity of risk (see also Poppo and Zenger 2002). Further the objectivity and provision of a track record about the other's performance, behavior and skills can further support trust building (Das and Teng 1998). This is consistent also with Bedard et al.'s (2005) views on the role of e-commerce systems reliability assurance as a vehicle for establishing stronger trust. Assurance helps reduce the asymmetries that arise in the presence of only imperfect information (e.g. Hunt 1997a). This leads to the eighth hypothesis:

H₈: As an organization's trust in a trading partner increases, the desirability of assurance over the trading partner's e-business processes will also increase.

Trust is instrumental to commitment and, in the presence of commitment to a trading partner, the existence of trust is the conduit through which an organization is willing to pursue stronger relationships with a trading partner (Morgan and Hunt 1994). Similarly, the view that control needs trust, and trust needs control, suggests that the two are intertwined in terms of developing effective MCS in a solid interorganizational relationship (Vosselman et al. 2009). Vosselman et al. view the rational approach as viewing trust and control as having a common goal—the absorption of behavioral uncertainty. Viewing control and trust in this intertwined fashion suggests that commitment will foster both trust and control simultaneously, although a certain level of trust must come first. This leads to the ninth and final hypothesis:

H_{9a}: As an organization's commitment to a trading partner increases, the desirability of assurance over the trading partner's e-business processes will also increase.

H_{9b}: The impact of an organization's commitment to a trading partner on assurance desirability will be mediated by trust in the trading partner.

We test each of the hypotheses individually while examining them in the overall context of a structural model. Hence, the hypotheses are also examined simultaneously within the overall context of the model.

III. METHODS

Data Collection

In order to test the above hypotheses, a web-based survey instrument was used and targeted to individuals with the knowledge, experience and expertise to evaluate the potential and risks associated with inter-organizational B2B e-commerce relationships as well as the ability and authority to influence B2B e-commerce interactions. To insure that the participants had the requisite skills, Chief Information Officers (CIOs), information systems security specialists, IT internal audit specialists with e-commerce experience, and e-commerce development staff were invited to participate. Prior to data collection, the survey instrument was pretested for ease of use, clarity, and time to complete by 42 individuals from the targeted groups. The responses provided by these participants were not used for hypotheses testing nor did these participants participate in this research beyond the pretest phase.

To reach the targeted sample, we employed a survey company who solicited potential participants via e-mail based on their job titles. Out of the e-mail solicitations, 1,021 respondents started the survey at the survey company's site. Each respondent was presented with the following pre-screening questions to evaluate their suitability for participation⁴:

⁴ The complex knowledge required to complete the survey across technical dimensions of e-commerce, business level activities with a trading partner, and response requirements about the trading partner, made identification of specific respondents on a broad scale basis difficult.

- 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?

If any of the questions were answered with a “no” response, the participant was not granted access to the survey. The pre-screening questions eliminated 149 individuals, leaving 872 potential participants. Out of the 872 qualified potential respondents, 266 (31%) completed the survey resulting in 210 (or approximately 80 percent) usable responses. Of the 56 discarded responses, 11 were eliminated due to inconsistencies between responses and 45 were eliminated because of incomplete data. Over 90% of survey respondents evaluated B2B e-commerce relationships with an external trading partner. Table 1 presents descriptive statistics on survey respondents' demographics.

[Please Insert Table 1 here]

Development of Measures

Scale items for the reflective constructs, trading partner's dependence on organizational relationship (Ganesan, 1994; Kumar et al., 1998), trading partner's core technical competency (Hart and Saunder, 1998; Armstrong and Sambamurthy, 1999), an organization's power over a trading partner (Kumar et al., 1998; Hart and Saunder, 1998), an organization's commitment to a trading partner (Ganesan, 1994; Hart and Saunder, 1998), and an organization's trust of a trading partner (Zaheer et al., 1998; Hart and Saunder, 1998), were adapted from measures used in prior

studies. Since assurance desirability over trading partner has not been examined in prior research, a scale to measure this construct was developed specifically for this study. All of the above scales were initially validated with data from a hold-out sample using PCA with oblique ($\Delta = 0$) rotation. With the exception of two items used in the power scale, all items loaded on their respective constructs at a minimum level of .65. An examination of the power scale items indicated that the wording of one of the items was not suitable for use in the present research context. The remaining four power items all load on a single construct with loads ranging from .57 to .86. Average variance extracted (AVE) ranged from a low of 58% for the power scale to a high of 81% for the core technical competency scale. All scales demonstrated acceptable reliability as indicated by Cronbach's alpha scores ranging from .749 for power to .926 for trust. Scale items with their corresponding minimum and maximum response scores, means, medians, and standard deviations are presented in Table 2

[Please Insert Table 2 here]

The B2B e-commerce risk construct was derived using both reflective and formative measurement techniques (Jarvis et al, 2003). The decision to model a given construct as formative or reflective was driven by the nature of the construct and the item measures developed. Reflective constructs are based on the premise that an unobservable latent construct causes changes in a group of observable measures. The observable measures, or items, are expected to move in the same direction in response to changes in the associated latent construct, be somewhat internally consistent, and be substitutable. Thus, removal of an item from the latent construct measurement model will not alter the meaning of the latent construct (Jarvis et al., 2003). In contrast, formative constructs are based on the premise that observable measures come together to create the latent construct. Therefore, changes in a single formative measure, or item,

can cause changes in the associated latent construct. Formative items are not expected to move in the same direction. Nor are they expected to be internally consistent or substitutable. Inappropriate removal of a formative item may alter the meaning of the latent construct (Jarvis et al., 2003).

A two-step process was utilized to produce a reflective construct, organizational B2B e-commerce risk, from three formative constructs: business level risk, application-user level risk, and technical level risk. In step 1, the formative constructs business level risk, application-user level risk, and technical level risk were constructed with formative items developed by Sutton et al. (2008) using a nominal group process. A total of 27 individuals (e.g. external IT audit managers and partners, internal IT auditors, IS security specialists, e-commerce consultants, e-commerce system developers) from five organizations participated in the nominal group process. Group participants had high levels of e-commerce, IT audit, and IS management expertise and represented a diverse set of business segments consisting of a food manufacturing company, an insurance company, a railroad and transportation company, a global audit firm, and an e-commerce consulting firm.

In step 2, the formative measures developed and validated in step 1 were used to produce PCA participant factor scores for the business level risk, application-user level risk, and technical level risk constructs. These PCA participant factor scores serve as reflective items of the global construct B2B e-commerce risk. This two-step process recognizes that an organization's B2B e-commerce risk is simultaneously influenced by individual trading partner relationships as well as the organization's own global B2B e-commerce policies and procedures. For a given trading partner, organizations inherit a wide range of business level, application-user level, and technical level risks that are unique to the B2B e-commerce relationship established with that trading

partner. While the business level, application-user level, and technical level risks inherited via a single B2B e-commerce trading partner relationship are unique, organizational level risk philosophies, risk appetites, risk tolerance, and control mechanisms are global in nature and directly influenced by the organization. Organizations will evaluate and institute risk policies, procedures and controls to manage simultaneously business level, application-user level, and technical level risks across all trading partners. Thus, these risk policies, procedures, and controls will be consistent and complementary with respect to business level, application-user level and technical level risks, and, to varying degrees, affect individual trading partner risk inherited by the organization. As such, these three levels of risk will move in tandem to reflect an acceptable or desirable level of organizational B2B e-commerce risk.

Consistent with step 1 discussed above, the business level risk, application-user level risk, and technical level risk formative constructs were evaluated for scale validity. Because formative items were not expected to be internally consistent, classical measurement theory tests for assessing construct validity were not applicable. Instead formative items were evaluated on multicollinearity (Diamantopoulos et al., 2008) and outer-item weights (Chin, 1998). Table 3 lists the variance inflation factors (VIF) and outer-item weights for the formative items used in this study. A review of prior literature indicates a lack of consensus concerning an unacceptable level of formative item multicollinearity. Recommended VIF levels range from a low of 3.3 (Petter et al, 2007) to a high of 10 (Diamantopoulos et al., 2008). Consistent with Petter et al (2007), we adopted a conservative VIF of 3.3 as a cutoff for formative item elimination. Three items, application-user level risk item 7 and technical level risk items 11 and 15, were eliminated because of VIF scores exceeding 3.3. All other formative items were retained.

Outer-item weights were assessed using a components based structural equation modeling technique (Ringle et al, 2005). Again, prior literature is unclear concerning the best treatment of insignificant item weights. Diamantopoulos and Winklhofer (2001) recommend removing non-significant items for parsimony. However, Bollen and Lennox, (1991) and Diamantopoulos et al. (2008) recommend retaining all items as the removal of a non-significant item may alter the meaning of the formative construct. We adopted the approach advocated by Bollen and Lennox (1991) and Diamantopoulos et al (2008) and retained all formative items. While this approach may include formative items that do not significantly contribute to the estimation of the formative construct, the prior elimination of formative items with VIF equal to or greater than 3.3 assured that the retained formative items were not inappropriately influencing formative construct estimation. Scale items, VIF scores, and outer-item weights and associated t-values are presented in Table 3.

[Please Insert Table 3 here]

Step 2 estimated individual participant factor scores for business level, application-user level, and technical level risk constructs based on their respective factor scores using the validated formative items from step 1. PCA with oblique ($\Delta = 0$) rotation was used to generate item eigenvalues. The eigenvalues for business level risk indicated the existence of a single construct, while the eigenvalues for application-user level risk (eigenvalues = 6.98 and 1.11) and technical level risk (eigenvalues = 8.89 and 1.14) formed two constructs. However, examination of the scree plots suggested the existence of one dominant construct for application-user level risk and one dominant construct for technical level risk. Parallel analysis confirmed this supposition. The results indicated that eigenvalues less than 1.34 for application-user level risk and 1.39 for technical level risk were spurious. Based on the analysis of the scree plots and

eigenvalues, we generated PCA participant factor scores for the application-user level risk and technical level risk constructs using PCA, with oblique ($\Delta = 0$) rotation, constrained to a single factor. The resulting B2B e-commerce scale demonstrates strong reliability as indicated by a Cronbach's alpha score of .93.

IV. MEASUREMENT AND STRUCTURAL MODEL RESULTS

Validation of the measurement model and structural model is conducted using a components based⁵ structural equation modeling technique (Ringle et al, 2005). All t-values and outer-item loadings are obtained from a bootstrap sample of 1000 iterations. Tables 4 and 5 report the loadings, cross-loadings, composite reliability scores, and AVE for all reflective items and constructs. The results indicate that all reflective items load significantly and at a higher level on their respective reflective construct than on any other reflective construct (Chin, 1998). The composite reliability scores of the reflective constructs are all greater than 0.70 (Nunnally and Bernstein 1994). All AVE are higher than .50, and the square root of all AVE are larger than the correlations between the reflective constructs (Chin 1998). These results support the convergent and discriminant validity of the reflective constructs (Chin 1998; Fornell and Larcker 1981).

[Please Insert Tables 4 and 5 here]

Figure 2 presents the structural model with path loadings and significance levels relating to the hypothesized relationships. All hypothesized relationships are significant. The overall strength of the model provides strong support for the overall R-A theory of competition that provides a basis for understanding partner relationships and the role of dependence, competence,

⁵ Components based structural equation modeling (SEM) is preferable to covariance based (SEM) for models that contain formative constructs. In addition, components based structural equation modeling is more robust to violation of the assumption of multivariate normality necessary for estimation of covariance based SEM (Haenlein and Kaplan 2004).

power, commitment, trust and risk on an organization's desire to enhance information quality and scope in assessing a trading partner's behavior within the relationship.

[Please Insert Figure 2 here]

H₁ predicts that increasing levels of trading partner's dependence increase the dominant partner's power over the trading partner. Consistent with prior research (Hart & Saunders 1998), the results indicate a positive (.545) and significant ($p < .001$) association between trading partner dependence and power over the trading partner. In addition, trading partner dependence explains 29.7% of the variation in power.

The effects of increasing power over a trading partner on B2B e-commerce risk are addressed in H₂. As predicted, increases in power over the trading partner are positively (.212) and significantly ($p < .01$) related to increases in B2B e-commerce risk inherited from the trading partner. However, power explains little (4.5%) of the variation in B2B e-commerce risk. Thus, the ability of a dominant partner to dictate e-commerce policy and procedures to a given trading partner does not appear to substantially impact B2B e-commerce risk. These results are consistent with prior research that indicates that power, while related, does not substantially alter the partner relationship (Hart and Saunders 1998). This suggests that B2B e-commerce risk may be better managed as an egalitarian relationship, consistent with that posited in the R-A theory of competition (Morgan and Hunt 1999; Hunt and Davis 2008).

H₃ predicts that increasing levels of B2B e-commerce risk are positively associated with an organization's increasing desire for assurance over a trading partner's B2B e-commerce processes. The results indicate a positive (.163) and significant ($p < .05$) relationship between B2B e-commerce risk and assurance desirability over a trading partner.

The mediating effect of B2B e-commerce risk on the positive association between power over a trading partner and assurance desirability is addressed by H_{4a} and H_{4b} and tested using the approach recommended by Barron and Kenny (1986). Figure 3 presents the isolated test results supporting the hypothesized mediation relationship. The direct positive (.401) and significant (p<.001) association between power over the trading partner and assurance desirability is established in step 1 and supports H_{4a}. Step 2 confirms the positive (.251) and significant (p<.001) relationship between power and B2B e-commerce risk. Finally, step 3 demonstrates that the direct positive association between power and assurance desirability decreases, but remains positive (.353) and significant (p<.001), when mediated by B2B e-commerce risk. Thus, B2B e-commerce risk partially mediates the relationship between power and assurance desirability. The Aroian version of the Sobel test is used to evaluate the significance of the partial mediation effect. The results indicate marginal support (t = 1.84; p = .065) for the mediation effect hypothesized in H_{4b}.

[Please Insert Figure 3 here]

H₅ posits that as trading partner dependency on an organization increases, the organization's commitment to the trading partner relationship will also increase. The results show a positive (.458) and significant (p<.001) relationship between trading partner dependence and commitment to the trading partner suggesting that dependence strengthens the commitment to a trading partner and the trading relationship.

H₆ addresses the relationship between trading partner core technical competency and commitment to the trading partner. The results indicate that trading partner core technical competency is positively (.486) and significantly (p<.001) associated with increasing

commitment. The results also indicate that trading partner dependence and core technical competency together account for 51.9% of the variation in commitment to the trading partner.

The positive effects of increasing commitment to the trading partner on trust of the trading partner are addressed by H₇. The results are consistent with the findings of Hart & Saunders (1998) and show that increases in commitment are positively (.680) and significantly ($p < .001$) associated with increases in trust of a trading partner. Commitment to a trading partner also explains 46.3% of the variation in trust of a trading partner.

H₈ predicts that increases in trust of a trading partner will be positively associated with increases in assurance desirability over a trading partner's B2B e-commerce processes. The results indicate significant support ($p < .01$) for the hypothesized (.243) relationship.

The mediating effect of trust of a trading partner on the positive association between commitment to a trading partner and the organization's increasing desire for assurance over a trading partner's B2B e-commerce processes is addressed by H_{9a} and H_{9b} and tested using the approach recommended by Barron and Kenny (1986). Figure 4 presents the isolated test results supporting the hypothesized mediation relationship. The direct positive (.271) and significant ($p < .001$) association between commitment and assurance desirability is established in step 1 and supports H_{9a}. Step 2 confirms the positive (.701) and significant ($p < .001$) relationship between commitment and trust of a trading partner. Finally, step 3 demonstrates the direct positive association between commitment and assurance desirability remains positive but decreases (.064) and becomes insignificant ($p > .05$) when mediated by trust in a trading partner. Thus, trust of a trading partner fully mediates the relationship between commitment and assurance desirability. The Aroian version of the Sobel test is used to evaluate the significance of the mediation effect. The results indicate support ($t = 2.29$; $p = .021$) for the mediation effect

hypothesized in H_{9b}. The model results also show that power, B2B e-commerce risk, and trust of a trading partner explain 26.19% of the variation in assurance desirability.

[Please Insert Figure 4 here]

V. DISCUSSION

In this study, we analyze the impact of relationship power differences and strength of relationship commitment with a given trading partner on the desirability of assurance over the trading partner's B2B e-commerce processes. We also examine the mediating effects of B2B e-commerce risk and trust in the trading partner on the direct relationships. Our results show that B2B e-commerce risk partially mediates the relationship between power and the desirability of B2B e-commerce assurance. However, the mediation effect is minor and there are strong direct effects for both B2B e-commerce risk and power on the desirability of assurance. Our results also show that trust fully mediates the relationship between assurance desirability and relationship commitment. We also show strong results for antecedents of power and commitment through dependence of the trading partner on the trading relationship and the core technology competence of the trading partner. On an overall basis, the hypotheses are all significant and in the predicted direction. Additionally, the explanatory power is quite high.

The results of the study provide strong support for the underlying R-A theory of competitiveness. Key among the tenants of R-A theory is that trading partners may still be motivated to enter into relationships where they are at a power disadvantage and recognize that constrained self-interest seeking behavior is more likely to lead to optimal comparative advantage. R-A theory also suggests that information an organization needs to assess the trading partner's behavior is both imperfect and costly to attain. Our research shows the combined effects of the desire to improve information about the trading partner's behavior and verification about the reasonableness of commitment and trust placed in that trading partner on the desirability of assurance. All three conditions are key to the development of sustainable, long-term trading relationships.

We specifically addressed three areas of concern in the interorganizational relationship literature in regards to MCS design. First, researchers have noted the need to pay more attention to risks rather than just trust (Miller et al 2008). Our findings on risk indicate that risk is an important determinant of the preferred governance structure over the interorganizational relationship. Second, researchers have noted the need to acknowledge and consider the critical role of IT in interorganizational relationships (Cuganesan and Lee 2006). Our study embedded both measures of the core IT competence and, more importantly, a comprehensive measure of e-business processes including technical level issues, application issues, and business process issues. Our broad-based measure proved to be a very solid measure of risk and provides insights into the role of e-commerce risk on trading relationships. Third, we address the need to focus on the impacts of unequal power in such relationships on the governance structures that may be most appropriate (Caker 2008). The effects of variance in power within the relationships provides evidence that assurance processes for B2B e-commerce risk are of interest to organizations who are in a position to mandate additional governance structures to be applied by their trading partners. Finally, we expand upon prior case study work to provide an analysis of a broad cross-section of firms representing a breadth of industries, while examining the issues across a complex model providing a representation of the overall organizational drivers of assurance.

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Figure 1: Research Model

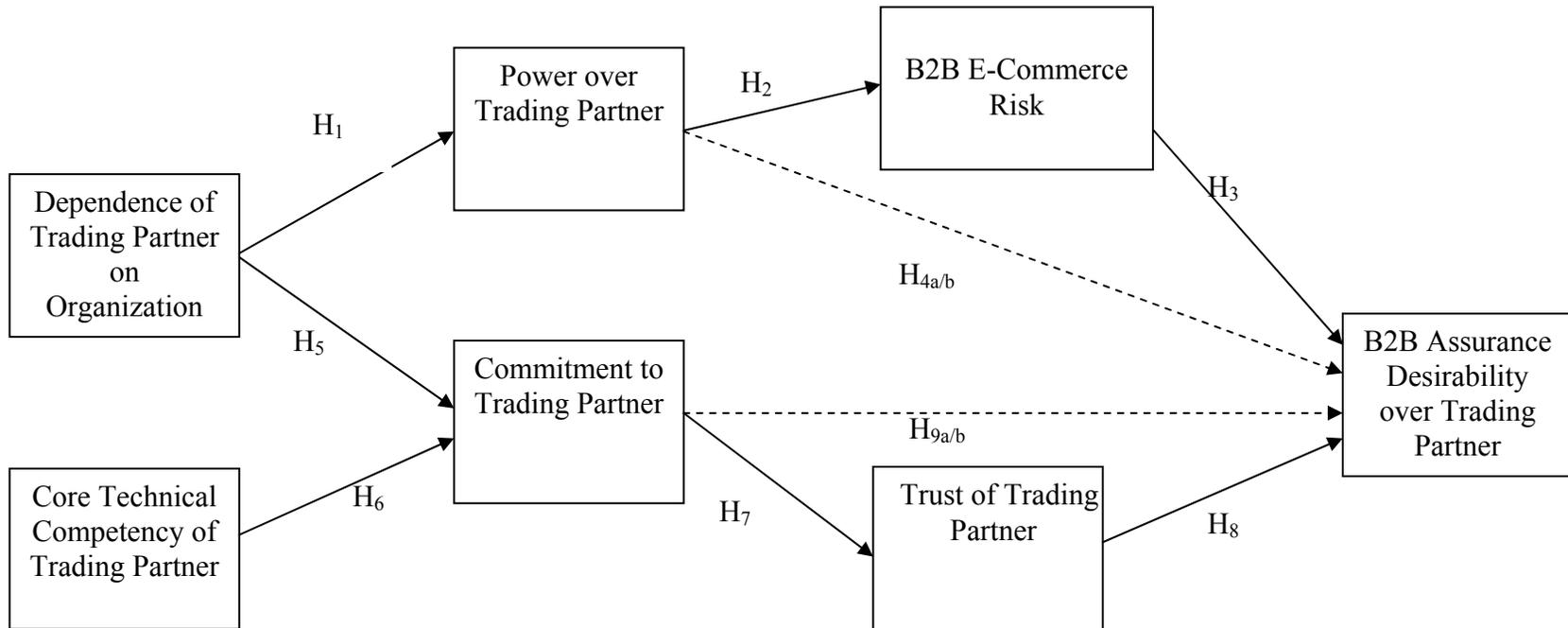
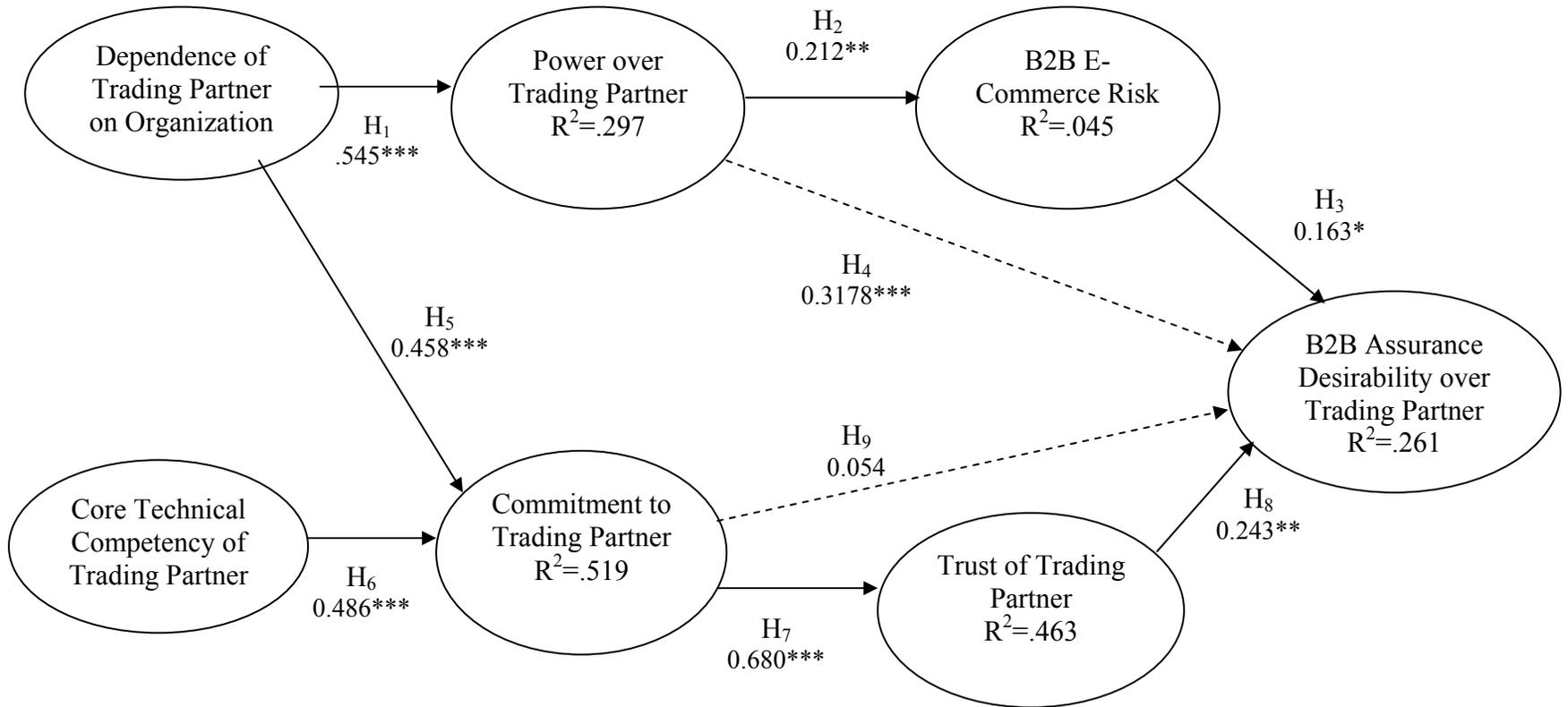


Figure 2 Model Results



* p-value <.05 level of significance
 ** p-value < .01 level of significance
 ***p-value < .001 level of significance

Figure 3 Structural Model Test of Mediating Effects of B2B E-Commerce Risk on Assurance

Desirability

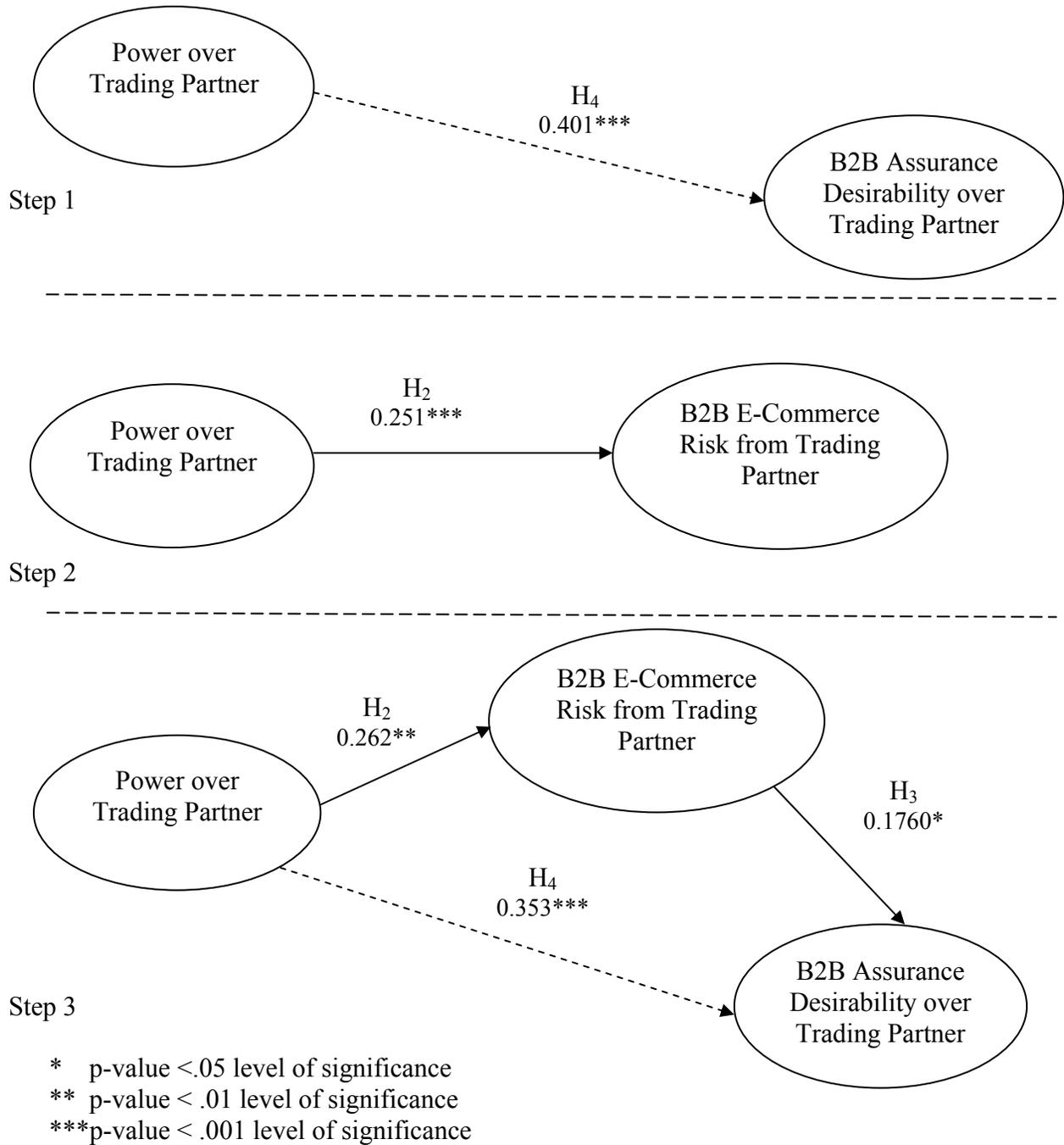


Figure 4 Structural Model Test of Mediating Effects of Trust on Assurance Desirability

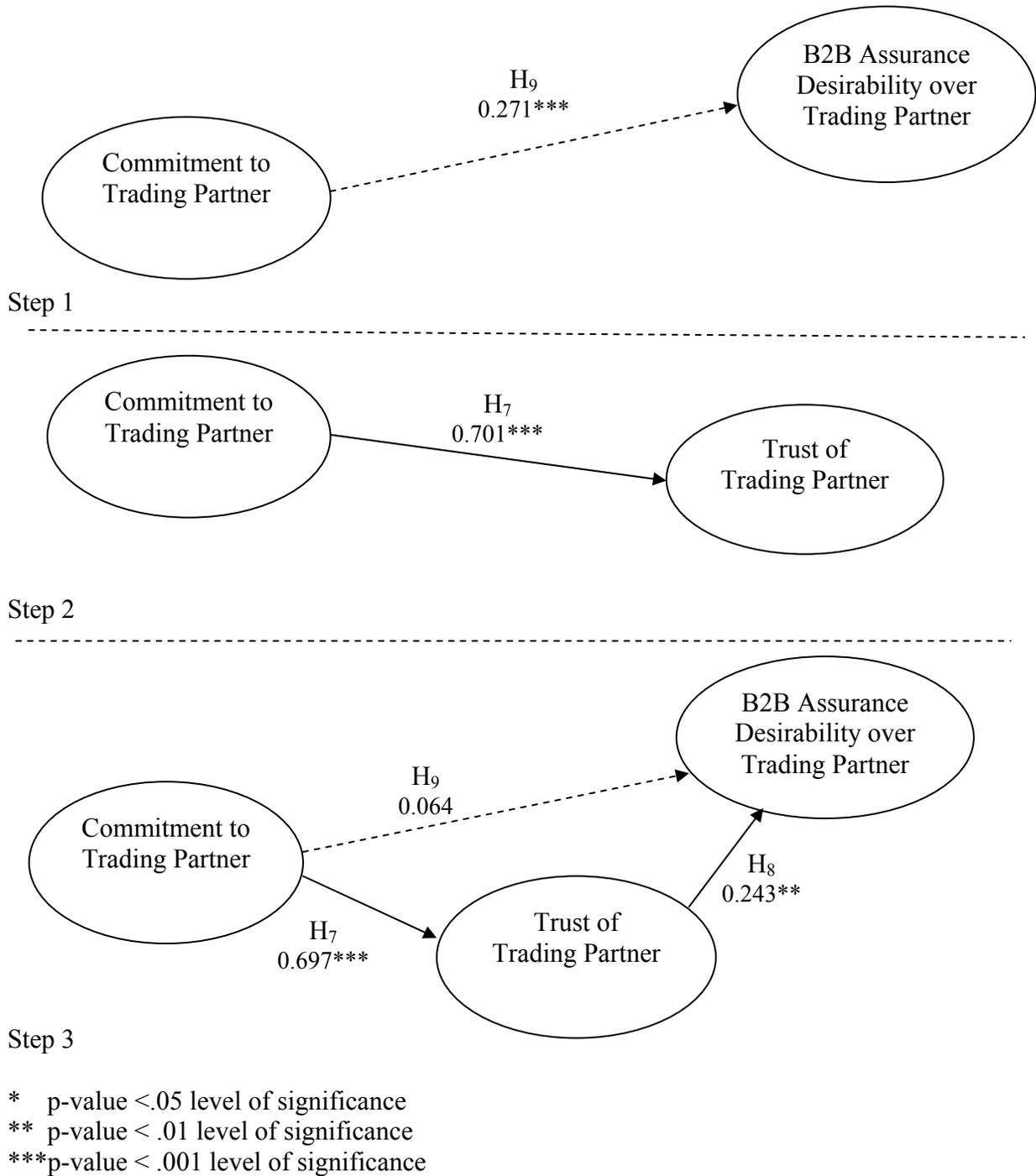


Table 1 Participant Demographics

Category	Frequency N = 210	Percentage
<i>Gender</i>		
Male	198	94.3
Female	12	5.7
Not answered	0	0
<i>Age (in years)</i>		
<22	1	0.5
22-27	1	0.5
27-32	9	4.3
31-37	35	16.7
37-42	37	17.6
42-47	40	19.0
47-52	33	15.7
52-57	29	13.8
>57	23	11.0
Not answered	2	1.0
<i>Experience in current job function (in years)</i>		
<1	1	0.5
1-5	30	14.3
5-9	53	25.2
9-13	48	22.9
13-17	25	11.9
17-21	20	9.5
21-25	19	9.0
25-29	13	6.2
>29	0	0
Not answered	1	0.5
<i>Organizational Structure</i>		
Publicly traded	194	92.4
Not publicly traded	12	5.7
Not answered	4	1.9
<i>Industry</i>		
Manufacturing	54	25.7
Insurance	17	8.1

Financial/real estate	16	7.6
Wholesale/retail	22	10.5
Technology	3	1.4
Utilities	8	3.8
Health	18	8.6
Communication	1	0.5
Aerospace & defense	27	12.9
Transportation	9	4.3
Other	32	15.2
Not answered	3	1.5
<i>B2B e-commerce functions conducted with this trading partner</i>		Multi-item
Purchasing/Order Management	153	72.9
Administration (including price/sales catalog)	73	34.8
Sales Analysis/Inventory Management	60	28.6
Billing/Payment	128	61.0
Shipping/Receiving	101	48.1
Bidding/Quotation (including RFP)	62	29.5
Partner Information/Acknowledgement	56	26.7
Other	13	6.2
Not answered	1	0.5
<i>B2B e-commerce functions used by your organization</i>		Multi-item
Purchasing/Order Management	167	79.5
Administration (including price/sales catalog)	98	46.7
Sales Analysis/Inventory Management	77	36.7
Billing/Payment	151	71.9
Shipping/Receiving	112	53.3
Bidding/Quotation (including RFP)	77	36.7
Partner Information/Acknowledgement	72	34.3
Other	5	2.4
Not answered	5	2.4
<i>B2B e-commerce purchase with this trading partner for current fiscal year (in dollars)</i>		
< 250,000	69	32.9
250,000-750,000	29	13.8
750,000-2.25 million	42	20.0
2.25 million-2.75 million	4	1.9
2.75 million-3.25 million	5	2.4
3.25 million-3.75 million	4	1.9
3.75 million-4.25 million	2	1.0
4.25 million-4.75 million	3	1.4

>4.75 million	45	21.4
Not answered	7	3.3

B2B e-commerce sales this trading partner for current fiscal year (in dollars)

< 250,000	72	34.3
250,000-750,000	22	10.5
750,000-2.25 million	33	15.7
2.25 million-2.75 million	9	4.3
2.75 million-3.25 million	2	1.0
3.25 million-3.75 million	4	1.9
3.75 million-4.25 million	4	1.9
4.25 million-4.75 million	4	1.9
>4.75 million	51	24.3
Not answered	9	4.3

All trading partners your organization currently uses EDI to transact business with

		Multi-item
Customers (e.g., Retailers, Supermarkets, etc.)	128	61.0
Wholesalers/Distributors	115	54.8
Manufacturers	100	47.6
Financial Institutions	87	41.4
Shipping Companies	66	31.4
Government (e.g., Customs)	45	21.4
Other	16	7.6
Not answered	1	0.5

Length of time your organization has used b2b e-commerce (in years)

<1	5	2.4
1-5	71	33.8
5-9	66	31.4
9-13	29	13.8
13-17	19	9.0
17-21	10	4.8
21-25	3	1.4
25-29	2	1.0
>29	3	1.40
Not answered	2	1.0

Table 2 Descriptive Statistics

Variable Measures	Item	Min	Max	Median	Mean	Std Dev.
<i>Dependence</i>						
Your organization's relationship is crucial to this trading partner's future performance. 1) Strongly Disagree to 7) Strongly Agree (Ganesan 1994)	dep1	1	7	5	4.53	1.81
This trading partner is dependent on your organization. 1) Strongly Disagree to 7) Strongly Agree (Ganesan 1994)	dep2	1	7	4	3.98	1.85
It would be difficult for this trading partner to replace the business generated from their relationship with our organization. 1) Strongly Disagree to 7) Strongly Agree (Kumar et al. 1998)	dep3	1	7	4	4.07	1.76
<i>Core Technical Competency</i>						
This trading partner is competent in accurately and efficiently processing electronic transactions. 1) Strongly Disagree to 7) Strongly Agree (Hart & Saunders 1998)	ctc1	1	7	6	5.34	1.45
The trading partner's computer systems are reliable. 1) Strongly Disagree to 7) Strongly Agree (Hart & Saunders 1998)	ctc2	1	7	6	5.43	1.38
This trading partner is extremely knowledgeable about the potential of current B2B e-commerce IT? 1) Strongly Disagree to 7) Strongly Agree (Armstrong & Sambamurthy 1999)	ctc3	1	7	6	5.32	1.45
<i>Power</i>						
Some of your organization's actions have a negative effect on this trading partner, but they cannot do anything to prevent it. 1) Strongly Disagree to 7) Strongly Agree (Kumar et al. 1998)	pwr1	1	7	4	4.10	1.66

Your organization, if it wanted to, has the capability to make things difficult for this trading partner. 1) Strongly Disagree to 7) Strongly Agree (Kumar et al. 1998)	pwr2	1	7	4	3.82	1.87
Your organization, if it wanted to, has the capability to tie this trading partner up in an expensive legal battle. 1) Strongly Disagree to 7) Strongly Agree (Kumar et al. 1998)	pwr3	1	7	4	3.59	1.93
To what extent did your organization influence your trading partner's decision to adopt B2B e-commerce (Internet or EDI-based)? 1) No Influence to 7) Very Strong Influence (Hart & Saunders 1998)	pwr4	1	7	3	3.10	1.97
Which was the primary force behind your trading partner's decision to adopt B2B e-commerce? 1) Entirely Your Organization to 7) Entirely Your Trading Partner (Hart & Saunders 1998)	pwr5 D	N/A	N/A	N/A	N/A	N/A
<i>Commitment</i>						
Your organization expects the relationship with this trading partner to last a lifetime. 1) Strongly Disagree to 7) Strongly Agree (Hart & Saunders 1998)	com1	1	7	5	4.66	1.66
Your organization assumes that renewal of agreements with this trading partner generally will occur. 1) Strongly Disagree to 7) Strongly Agree (Hart & Saunders 1998)	com2	1	7	6	5.27	1.52
The relationship with this trading partner is essentially "evergreen," and will continue to be a good relationship. 1) Strongly Disagree to 7) Strongly Agree (Hart & Saunders 1998)	com3	1	7	5	5.05	1.49
Your organization believes that over the long run the relationship with this trading partner will be profitable. 1) Strongly Disagree to 7) Strongly Agree (Ganesan 1994)	com4	1	7	6	5.47	1.57

Your organization focuses on long-term goals with this trading partner. 1) Strongly Disagree to 7) Strongly Agree (Ganesan 1994)	com5	1	7	5	5.10	1.65
Your organization is willing to make sacrifices to help this trading partner from time to time. 1) Strongly Disagree to 7) Strongly Agree (Ganesan 1994)	com6	1	7	5	4.78	1.67
<i>Trust</i>						
Deadlines set by this trading partner are honest and accurate. 1) Strongly Disagree to 7) Strongly Agree (Hart & Saunders 1998)	trt1	1	7	5	5.08	1.46
This trading partner is honest in business dealings. 1) Strongly Disagree to 7) Strongly Agree (Hart & Saunders 1998)	trt2	1	7	6	5.49	1.44
This trading partner is willing to share information. 1) Strongly Disagree to 7) Strongly Agree (Hart & Saunders 1998)	trt3	1	7	6	5.26	1.38
The trading partner adheres to agreements. 1) Strongly Disagree to 7) Strongly Agree (Hart & Saunders 1998)	trt4	1	7	6	5.23	1.36
This trading partner has always been evenhanded in their negotiations with our organization. 1) Strongly Disagree to 7) Strongly Agree (Zaheer et al. 1998)	trt5	1	7	6	5.22	1.42
<i>B2B Assurance Desirability</i>						
Your organization would desire a formal review by your internal audit department of this trading partner's B2B e-commerce risks. 1) Strongly Disagree to 7) Strongly Agree	ad1	1	7	4	4.40	1.65
Your organization would find third party certification of this trading partner's B2B e-commerce risks advantageous. 1) Strongly Disagree to 7) Strongly Agree	ad2	1	7	4	4.21	1.61

Your internal auditors would consider recommending to management that this trading partner be required to attain assurance over their B2B e-commerce related systems. 1) Strongly Disagree to 7) Strongly Agree	ad3	1	7	4	3.58	1.65
<i>B2B E-Commerce Risk Reflective Scale</i>						
Business Level Risk Factors	blr	-2.22	2.87	-.015	0	1
Application-User Level Risk Factors	aulr	-2.44	2.45	.017	0	1
Technical Level Risk Factors	tlr	-2.47	2.33	.082	0	1

RC: Items reverse coded

D: Items dropped

Table 3 B2B E-Commerce Risk

Formative Measures	Item	VIF	Weights	t-value
Business Level Risk Factors				
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	-.014	.038
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	.158	.658
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	.221	1.121
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	-.119	.465
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	-.013	.170
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	.106	.432

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	-.224	.929
Trading partner's understanding of risks associated with their projects and accordingly executing effective project management.	blr8	2.47	.271	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	-.068	.402
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	-.262	1.25
Trading partner's broad management involvement in IT/business planning while maintaining independence in the selection of technology preferences.	blr11	2.373	.584	3.14
Trading partner's integration of applications into organizational procedures and guidelines – including comprehensive documentation.	blr12	2.18	-.300	1.488
Auditability of trading partner's system based on effective monitoring controls and audit trail (history of electronic data, updates, changes).	blr13	1.95	.349	2.006
Trading partner's ability to protect a distinguished Brand in an e-commerce environment.	blr14	1.76	.147	.686
Trading partner's resilience to a business interruption.	blr15	1.72	.069	.512
Application-User Level Risk Factors				
Appropriate level of training for trading partner's users and related cost constraints.	aulr1	2.19	-.005	.007

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)?	aulr2	2.20	.089	.371
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.	aulr3	2.38	-.061	.230
Trading partner's understanding of and agreement on data structure/scope/business rules for exchange of information.	aulr4	2.51	-.400	2.122
Is there benefit of B2B ventures to the trading partner and is the e-business marketplace sustainable?	aulr5	2.30	.019	.258
Clear and sufficient contract documentation on policies, procedures, connectivity guidelines, limitations, review plan, etc. (Service Level Agreements).	aulr6	2.17	.135	.671
Application controls in place for completeness, accuracy, and processing integrity (i.e. trading partner's applications function as intended).	aulr7 D	3.65	N/A	N/A
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.	aulr8	2.83	.379	1.94
Third party assurance of transaction validity.	aulr9	1.58	.075	.493
Marketing cost to sell the trading partner on a given B2B application	aulr10	1.73	.234	1.13
Privacy of data agreements.	aulr11	2.04	-.155	.758
Alignment of trading partner's business processes with implemented B2B e-business technologies.	aulr12	2.31	-.025	.083

Adequacy of the security over access to trading partner's business application systems.	aulr13	2.19	.177	.797
Inaccurate, inadequate or outdated documentation on systems software/hardware provided by trading partner.	aur114	1.89	.167	.726
Trading partner's inability to have an enterprise view of the full range of trading partner relationships.	aur15	2.08	.371	1.867
Technical Level Risk Factors				
Change management processes in place to assure maintenance of security and integrity of systems as technology evolves rapidly.	t1r1	2.18	.079	.686
Trading partner's security over all networks and network interactions ensure transmission integrity and provide guaranteed delivery transaction to the correct trading partner.	t1r2	2.793. 93	.030	.0261
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.	t1r3	2.41	-.047	.122
Trading partner's maintenance of data accuracy during systems conversion and application usage.	t1r4	2.80	-.114	.366
Completeness and accuracy of trading partner's data processing activities.	t1r5	3.09	.077	.306
Metrics related to capacity, resiliency, and monitoring in order to better predict/control performance by trading partner.	t1r6	2.09	-.274	1.322
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.	t1r7	3.00	.100	.353

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	.187	.674
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	.082	.357
Controls to enforce compliance with regulatory requirements and to enforce regulations	tlr10	2.67	.026	.035
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 D	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	.186	.775
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	.462	1.76
Flexibility and scalability of the trading partner's system (hardware/software independence).	tlr14	2.78	.157	.719
Redundancy and failover of trading partner's systems (in relation to downtime tolerance).	tlr15 D	4.10	N/A	N/A
Adequacy of trading partner's disaster recovery plan.	tlr16	2.12	-.184	.990
Adequate staff expertise available on an as-needed basis.	tlr17	2.26	-.241	1.142
Comprehensive systems documentation of trading partner's systems.	tlr18	2.26	.190	.834

Table 4 Item Loadings and Cross-Loadings^a

Constructs Measured Using Reflective Items							
Reflective Items	B2B Assurance Desirability	B2B E-Commerce Risk	Core Technical Competency	Commitment	Dependence	Power	Trust
ad1	0.885	0.284	0.261	0.299	0.310	0.370	0.271
ad2	0.892	0.178	0.325	0.281	0.245	0.289	0.320
ad3	0.891	0.293	0.193	0.203	0.247	0.331	0.291
blr	0.271	0.912	0.072	0.177	0.194	0.188	0.189
aulr	0.294	0.969	0.128	0.151	0.134	0.204	0.187
tlr	0.233	0.920	0.097	0.155	0.093	0.202	0.166
ctc1	0.323	0.126	0.932	0.543	0.169	-0.018	0.722
ctc2	0.253	0.129	0.945	0.521	0.136	-0.070	0.703
ctc3	0.220	0.034	0.886	0.485	0.147	0.024	0.612
com1	0.281	0.157	0.317	0.724	0.523	0.151	0.473
com2	0.144	0.087	0.559	0.871	0.297	-0.008	0.620
com3	0.252	0.126	0.452	0.785	0.366	0.048	0.592
com4	0.201	0.163	0.577	0.883	0.423	0.076	0.627
com5	0.319	0.183	0.506	0.843	0.483	0.178	0.563
com6	0.233	0.110	0.249	0.720	0.549	0.308	0.383
dep1	0.380	0.180	0.246	0.540	0.905	0.515	0.361
dep2	0.190	0.086	0.063	0.386	0.845	0.440	0.221
dep3	0.194	0.116	0.095	0.459	0.853	0.457	0.228
pwr1	0.228	0.169	-0.115	-0.073	0.325	0.654	-0.108
pwr2	0.171	0.076	-0.010	0.193	0.529	0.827	0.112
pwr3	0.363	0.185	-0.072	0.113	0.447	0.860	-0.005
pwr4	0.350	0.211	0.117	0.180	0.322	0.647	0.158
trt1	0.296	0.182	0.662	0.515	0.193	0.063	0.844
trt2	0.319	0.135	0.678	0.648	0.309	0.034	0.937
trt3	0.345	0.238	0.569	0.629	0.353	0.158	0.862
trt4	0.233	0.148	0.753	0.668	0.270	-0.016	0.888
trt5	0.234	0.139	0.547	0.470	0.238	0.002	0.828

^aItem loadings and cross-loadings are estimated using PLS (Ringle et al, 2005). All item loadings are significant at the p<.05 (2-tailed)

Table 5 Construct Correlations, Average Variance Extracted^a, Square Root of Average Variance Extracted^b, and Composite Reliability^c

	Assurance Desirability	B2B E- Commerce Risk	Core Technical Competency	Commitment	Dependence	Power	Trust
<i>Panel A: Construct Correlations, Average Variance Extracted, Square Root of Average Variance Extracted</i>							
B2B Assurance Desirability	.791 .889						
B2B E- Commerce Risk	0.286	.873 .934					
Core Technical Competency	0.290	0.089	.849 .921				
Commitment	0.294	0.194	0.561	.651 .807			
Dependence	0.302	0.162	0.164	0.538	.754 .869		
Power	0.371	0.206	-0.024	0.150	0.546	.567 .753	
Trust	0.330	0.191	0.739	0.680	0.317	0.060	.761 .872
<i>Panel B: Composite Reliability</i>							
	.919	.954	.944	.918	.902	.838	.941

^aAVE is the upper number on the diagonal

^bThe square root of AVE is the lower number on the diagonal

^cItem loadings and cross-loadings are estimated using PLS (Ringle et al, 2005).