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An Examination of Familiarity, Risk and Trust in Inter- Organizational Data Exchange Relationships

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ABSTRACT

This study examines the impact of trading partner familiarity on two types of trusting-beliefs (goodwill-trust and competence-trust) and two types of perceived risk (relational-risk and performance-risk) in interorganizational data exchange relationships. A questionnaire and experimental simulation are utilized to provide empirical evidence supporting the study's propositions. Results show that familiarity has a positive influence on both competence-trust and goodwill-trust and a negative influence on both performance-risk and relational-risk. This study contributes to a further understanding of the processes by which familiarity may influence interorganizational relationships and presents findings that have implications for future research in this area.

Keywords

Interorganizational systems, familiarity, trust, risk.

INTRODUCTION

Contemporary organizations face complex business environments that require rapid responses in their interactions with trading partners which entail both opportunities and threats. Accordingly, they develop various types of interorganizational relationships (IORs) and utilize interorganizational systems (IOSs) to facilitate communication. Within each business relationship, an inherent conflict exists between cooperative behavior and acts to deter risk and opportunism. Perceptions of trust and risk are essential for the daily activities and strategic orientation of these business relationships. As a result, it is important to develop a comprehensive understanding of the processes of trust and risk that exist in such relationships. The objective of this research is to enable more detailed investigation into trusting beliefs and perceived risks within IORs. More particularly, we examine two types of trusting-beliefs (goodwill-trust and competence-trust) and two types of perceived risks (relational-risk and performance-risk). We examine the effect of partner familiarity on these components of inter-organizational trust and risk, as familiarity has been shown in the literature to be an important antecedent of success in interorganizational relationships (eg. Gefen 2000; Gefen, Wyss, and Lichtenstein 2008).

Trust and risk are intimately interlinked as both relate to interpretations of behavior of other parties within the complex domain of social interaction. The intimate interlinkage between trust and risk makes it theoretically and empirically challenging to differentiate between the constructs and their foundations. However, this distinction is important for advancing research knowledge in the current business environment characterized by complex interactions among trading partners. On the one hand, the theoretical distinction between trust and risk is important as these two concepts, while interlinked, may have distinct characteristics and effects. Trust focuses on an egocentric psychological state relating the positive perception about others to oneself (McAllister 1995, Sako 1998), while risk focuses mainly on potentially negative outcomes and the uncertainty related to a particular party (Mitchell 1995). On the other hand, it is important to empirically analyze the social and psychological forces that influence decision making in the management of interorganizational data exchange relationships.

INTERORGANIZATIONAL TRUST

Social and management scholars perceive trust as an important element in interorganizational relationships (Hart & Saunders, 1997). Trust is only possible in a situation where the potential damage is greater than the advantages one seeks, otherwise it is simply an issue of calculation (Deutsch 1958, Luhmann 2000). Hence, trust is only necessitated when undesirable outcomes would cause the actor to regret his or her actions. Trust is associated with the willingness to invest in resources and success of various types of interorganizational systems ranging from electronic markets to specialized highly customized systems (Hart & Saunders, 1997; Kotlarsky & Oshri, 2005). Numerous studies conceptualize trust as a multidimensional concept that distinguishes between rational cognition and affective emotions (McAllister 1995, Sako 1998, Ibrahim & Ribbers 2009). In this study, we distinguish between competence-trust and goodwill-trust.

Competence-trust includes the trustor beliefs that a trustee has the necessary skills and abilities to carry out specific actions and achieve desired results. Competence-trust is based on the perceived partner's expertise and proficiency to realize performance within a specific domain (Mayer et al 1995; Sako 1998). In social psychology, cognitive familiarity between actors and sensible interpretations are argued to provide rational foundations for trust (Brownlie & Howson, 2005). Perceptions of partner competence thus establish a basis for a leap of faith.

Goodwill-trust includes the trustor beliefs regarding the trustee's intentions. Goodwill-trust is associated with the belief that the trustee's willingness to act is in accordance with the interests of the trustor. This belief is based on the shared positive perceptions and attitudes of key personnel or organizational boundary role persons (Child, 2001, Currall and Judge, 1995). The existence of such trust is associated with positive prospects and increased willingness to adopt inter-organizational systems (Hart and Saunders 1998).

INTERORGANIZATIONAL RISK

The uncertainty associated with decision outcomes and threats of negative consequences render risk as an inherent trait of inter-organizational relationships. Mitchell (1995) defined risk as the probability for loss and the significance of that loss to the organization or individual. Losses from a business relationship can be attributed to various factors related to the business partner or external environment. For example, specific financial losses can be caused by modifications in tax laws and other social losses can be caused by being associated with a business partner that is exposed negatively in public media outlets. These losses are related to different types of risk. In this study we distinguish between performance-risk and relational-risk.

Relational-risk relates to the probability of not having satisfactory commitment from the business partner (Das and Teng 1996). The lack of commitment may cause the partner to decrease his efforts and determination to achieve mutual interests.

The lack of commitment can also cause the partner not to cooperate in a manner as expected and perhaps withhold important information. Relational-risk is also related to the danger of the partner leaking the information to competitors and harming strategic interests of the focal organization (Nooteboom 2000). Some of these concerns can be reduced by negotiating explicit and contingent contracts. However, such contracts may be incomplete (Tirole 2009) and may decrease trust between the parties (Malhotra and Murnigham 2002).

Performance-risk is related to the probability that alliance objectives are not achieved, despite satisfactory cooperation from the business partner (Das and Teng 1996). Performance-risk includes risks related to intensified competition, new technologies, governmental policies and bad luck. The partner organization may have the keen intention for cooperation, however the shared objectives are not realized due to better performance of a competitor that utilizes different technologies.

TRADING PARTNER FAMILIARITY AND EFFECTS ON INTERORGANIZATIONAL RISK AND TRUST

Social interaction and familiarity have been dramatically altered by the use of information technology. Past IS research has reported findings which suggest that cooperative relationships continue due to experience and familiarity between organizations. Familiarity is argued to have a positive influence on interorganizational trust (Gefen 2000; Gulati 1995) and a negative influence on interorganizational risk (Gefen et al., 2008). Due to the complex nature of these concepts it is useful to have a better understanding as to which types of trust and risk are influenced by familiarity. This enables an enhanced understanding as to whether familiarity is important for the two types of trust (competence-trust and goodwill-trust) and the two types of perceived risk (performance-risk and relational-risk).

We expect familiarity to have a positive impact on competence-trust because familiarity can provide rational foundations to trust a particular actor (Brownlie & Howson, 2005). Having intimate knowledge of the expertise of the partner increases competence-trust. The focal organization is able to assess the expertise of the partner more accurately. Adam Seligman (1997) argues that familiarity allows the actor to accredit the values that condition the actions of the other actor and hence enables the first actor to have expectations towards the second actor. Furthermore, familiarity enables the business partner to conduct tangible actions and to gain trust based on tangible proofs of its competence. Therefore, familiarity is expected to have a positive impact on competence-trust.

Proposition 1 Familiarity positively affects competence-trust.

We expect familiarity to have a positive impact on goodwill-trust because increased communications increases a shared view on the environment. This can also increase empathy between the business partners and improve the understanding between them. Such a close familiarity relationship will encourage them to drop organizational boundaries and share sensitive information. Moreover, positive consistent behavior encourages the partners to continue and renew contracts. This is realized as the business partners have sincere intentions to succeed in the relationship. Hence, familiarity is expected to have a positive impact on goodwill-trust.

Proposition 2 Familiarity positively affects goodwill-trust.

We expect familiarity to have a negative impact on performance-risk. More information regarding the business partner enables the focal organization to make better decisions as more knowledge can increase confidence in predicting the behavior of the partner. The ongoing relationship indicates that the partner has proved the ability to get things done. Besides the public reputation of the effective successful partner, the focal organization has first-hand experience that the partner can utilize the required means to achieve the objectives of the relationship. Thus, familiarity is expected to have a negative impact on performance-risk.

Proposition 3 Familiarity negatively affects performance-risk.

We expect familiarity to have a negative impact on relational-risk. The actions of the partner indicate that it has good intentions and is dealing fairly. The lack of opportunistic behavior hence decreases fears of shirking and decreases relational-risk. McGinn and Keros (2002) showed that familiar actors are more often cooperative in bargaining with each other than strangers. They also find out the more cooperative interactions increase the success of bargaining and balance the distribution of revenues across the actors. This is because the business partners show they are dedicated to the objectives of the relationship. Consequently, familiarity is expected to have a negative impact on relational-risk.

Proposition 4 Familiarity negatively affects relational-risk.

METHODOLOGY

Our research approach incorporates the combination of a questionnaire and experimental simulation. The questionnaire allows us to measure respondents' perceptions of the constructs. This enables us to pinpoint perceptual factors that are relevant for each dependent variable. The experimental setting allows us to achieve greater control and to manipulate variables. Manipulating variables is beneficial as it provides control over timing, which is essential for causality. Hence, the combination of questionnaire and experimental simulation provides the opportunity to acquire rigorous findings and provides stronger evidence regarding causality.

Participants

Potential participants were invited to the survey and requested to provide information regarding their professional experience and procurement responsibilities. Individuals were selected based on answering the question "Have you ever had a job responsibility where you purchased goods on behalf of your employer?" 263 potential participants were excluded due to a negative response to this question. 215 participants were included and participated in the experiment and answered all questions.

Experimental procedures and tasks

Subsequent to the participant selection, the next page in the experimental materials described how extensible markup language (XML) technology enables web-based data exchanges. This was followed by a description of two data exchanges: either data exchange A (with high transparency in the controls applied to the exchanged data) or data exchange B (with low transparency in data controls); participants were also shown a link to the website of their particular exchange. Each participant needed to register as a new customer for the fictitious vendor and place transactions using the exchange. The participants got acquainted with the exchange by placing two practice transactions before placing their "real" order. Following, the practice session, the participants were requested to assume the role of a purchasing manager in a manufacturing plant placing a needed raw-materials order. To manipulate relational characteristics, participants were requested to buy either (1) standard materials from a new business partner or (2) unique materials from a preferred supplier. In both cases, participants received explanation of the status of the relationship with the business partner and features of the product. Finally, all participants submitted an actual order on their simulated web exchange.

Measurement of variables

After placing the order, all participants answered questions relating to their experience with the website to measure the endogenous variables. Competence-trust and goodwill-trust items were adopted from McKnight et al. (2002). We tried to capture more nuance and therefore we supplemented those with items from Sengün and Wasti (2007). Performance-risk items were adopted from Das and Teng (2001). The items were slightly modified to coincide with the context of this study. Relational-risk items were taken from Ratnasingam (2003) and modified to correspond with the context of this study. Table 1 shows all items.

To ensure content validity, the items were pretested on 50 participants of the same population as the main survey. The pretest results were used to modify the wording of some items as well as the sequence of items within the questionnaire.

Reliability and validity

We utilized Cronbach's alpha and exploratory factor analysis to assess the reliability and unidimensionality of each construct. These tests are prerequisite for further analysis (Nunally, 1967; DeVellis, 1991). Factor analysis revealed four distinctive factors corresponding with the two type of trust (competence-trust and goodwill-trust) and two types of risk (performance-risk and relational-risk). Results of factor analysis are depicted in appendix A.

Literature on empirical psychological studies recommend grouping multiple items into parcels that are used to measure complex construct (Coffman et al. 2005). This results in small number of unidimensional parcels for each construct (Kishton et al. 1994). Parcels reduce the sampling error of the divergence between a sample and a population (MacCallum et al. 1999). Accordingly, two or more parcels of each construct were created and used in this study. Table 1 shows the items included in each parcel.

Items	Parcel	Cronbach's Alpha
Competence-trust (Strongly agree - Strongly disagree)		
1. The vendor has the necessary skills to manufacture the ordered products 4. The vendor is a very reliable manufacturer 5. The vendor is an excellent source of accurate information	Competence-trust 1	0.872
2. The vendor has the necessary abilities to achieve the desired results 3. The vendor is very knowledgeable in producing the product I ordered 6. The vendor really knows its business	Competence-trust 2	0.890
Goodwill-trust (Strongly agree - Strongly disagree)		
1. The vendor acts in our interest 3. The vendor cares about our company.	Goodwill-trust 1	0.831
2. The vendor is interested in our well being, not just in its own. 5. The vendor is sincere and genuine	Goodwill-trust 2	0.804
4. The vendor is concerned about our interests	Dropped	
Performance-risk (Strongly agree - Strongly disagree)		
3. Risk of vendor lacking the abilities to perform as expected 5. Risk of vendor not operating well 7. Risk of vendor not having the required knowledge to execute the order	Performance-risk 1	0.874
4. Risk of vendor not producing the required products 6. Risk of vendor facing performance problems	Performance-risk 2	0.865
1. The vendor is committed to accomplish the goals of the relationship 2. The vendor is dedicated to accomplish the goals of the relationship	Dropped	
Relational-risk (extremely unlikely – extremely likely)		
2. Risk of vendor demonstrating opportunistic behavior 3. Risk of vendor demonstrating conflicting attitude 4. Risk of vendor having hidden agenda	Relational-risk 1	0.894
1. Risk of vendor not being cooperative 5. Risk of enduring losses due to low commitment of vendor	Relational-risk 2	0.819
Familiarity manipulation checks (Strongly agree - Strongly disagree)		
1. In my role as a purchasing manager, I placed the order specified in this exercise from an existing, preferred supplier	Control Familiarity 1	-
2. In my role as a purchasing manager, I placed the order specified in this exercise from our usual supplier of this product	Control Familiarity 2	-

Table 1. Parcels

Data Analysis and Results

We utilized structural equation modeling (SEM) to validate the propositions as it enables validating several relations simultaneously (Gefen et al. 2000). LISREL consists of two parts: the measurement model and the structural equation model. The measurement model focuses on the relations between the measured items and their underlying constructs. The structural equation model focuses on the causal relations between the constructs as put forward by the propositions. Following recommendations of (Gefen et al. 2003; Gerbing et al. 1988) we followed a two-staged approach whereby the measurement model is calculated and fixed before the structural model is estimated.

LISREL confirmatory factor analysis (CFA) was used to test for convergent and discriminant validity. Table 2 includes the loadings and t-values of each parcel within the measurement model. The measurement model showed acceptable model fit. The χ^2 of 26.23 with 25 degrees of freedom is a χ^2 to df ratio of less than the recommended 1:3. The GFI at 0.977, AGFI at 0.949, NFI at 0.985, CFI at 0.998, RMR at 0.0198, and RMSEA at 0.015 are all within acceptable limits for CFA.

Subsequently, the structural model was constructed by relating the familiarity with the other structural constructs. Examination of the structural model reveals that the fit measures are acceptable: χ^2 to degrees of freedom ratio of 1:2.065 (χ^2_{35} = 119.50), The GFI at 0.90, AGFI at 0.85, CFI at 0.94, NFI at 0.92, and RMSEA at 0.109 are within acceptable limits; only the RMR at 0.12 is slightly above the recommended threshold. Figure 1 shows the standardized LISREL path coefficients. Familiarity has a significant positive impact on competence-trust and goodwill-trust and thus propositions 1 and 2 can be accepted. Familiarity has a significant negative impact on performance-risk and relational-risk and thus propositions 3 and 4 can also be accepted.

Parcel	Standardized loading	t- value
Competence-trust 1	0.966	19.060
Competence-trust 2	0.948	18.419
Goodwill-trust 1	0.898	16.311
Goodwill-trust 2	0.909	16.628
Performance-risk 1	0.989	19.701
Performance-risk 2	0.944	18.164
Relational-risk 1	0.895	16.147
Relational-risk 2	0.967	18.198
Control Familiarity 1	0..904	12.650
Control Familiarity 2	0.747	11,289

Lisrel CFA Fit statistics:

χ^2_{25} = 26.233,

RMR = 0.0198

RMSEA= 0.0150

GFI = 0.977

AGFI = 0.949

NFI = 0.985

CFI = 0.998

Table 2. Parcel Loadings

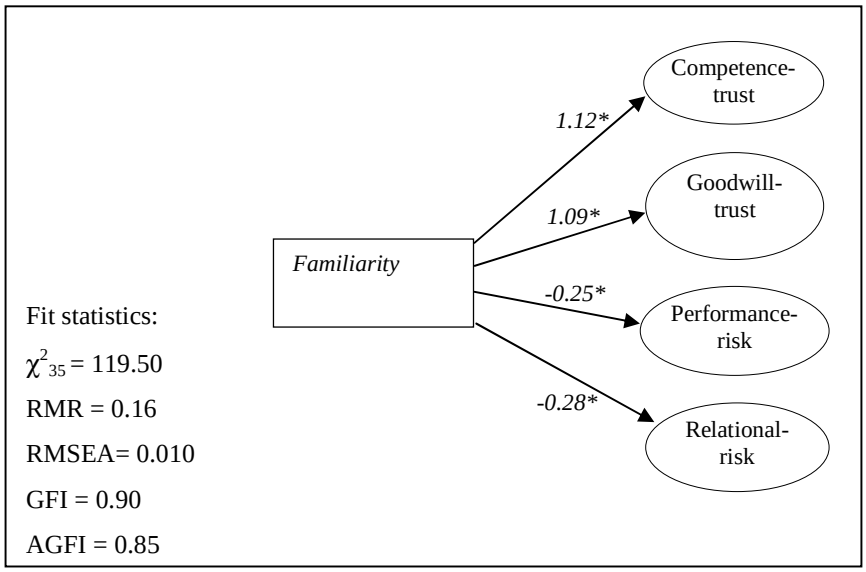

Figure 1. Structural model

DISCUSSION & CONCLUSION

In this study we have conducted a questionnaire and experimental simulation to be able to empirically measure competence-trust, goodwill-trust, performance-risk and relational-risk simultaneously. This is difficult due to the high theoretical and empirical relatedness and proximity of the constructs. Factor analysis shows that the items we utilized have sufficient discriminant validity to distinguish empirically between these four types of constructs. This enables us to empirically examine the effect of trading partner familiarity on each of these different constructs, while controlling for their interrelationships in a structural equations model.

The measurement of each separate type of trust and risk enables a more accurate conceptual understanding of interorganizational relationships, and how they are affected by the antecedent factor of trading partner familiarity. As partner familiarity has been shown in the past research to be an important antecedent of success in interorganizational relationships (eg. Gefen 2000; Gefen, Wyss, and Lichtenstein 2008), this study extends this body of knowledge by providing evidence on its effects on the two major constructs of trust and risk that were shown in past research to be important determinants in the success of interorganizational data exchanges (Nicolaou and McKnight 2006). This study further contributes by demonstrating empirically the distinctions in the constructs of trust and risk and their foundations.

Future research can focus on examining the influences of each distinctive type of trust and risk. It would be interesting to provide a comparative analysis to show whether any positive effects of competence or goodwill-trust off-set any potentially negative effects of performance or relational-risk on an outcome of interest, such as intention to use an inter-organizational data exchange in the future.

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Appendix A. Rotated Component Matrix

	Component			
	1	2	3	4
comp_1 The vendor has the necessary skills to manufacture the ordered products	**,841**	,202	,018	-,172
comp_2 The vendor has the necessary abilities to achieve the desired results	**,875**	,245	,024	-,070
comp_3 The vendor is very knowledgeable in producing the product I ordered	**,836**	,312	,005	-,059
comp_4 The vendor is a very reliable manufacturer	**,800**	,428	-,022	-,006
comp_5 The vendor is an excellent source of accurate information	**,733**	,452	-,112	,014
comp_6 The vendor really knows its business	**,734**	,473	-,140	,015
perf_3 Risk of vendor lacking the abilities to perform as expected	,074	-,100	**,861**	,271
perf_4 Risk of vendor not producing the required products	,010	-,120	**,871**	,267
perf_5 Risk of vendor not operating well	-,056	-,073	**,863**	,312
perf_6 Risk of vendor facing performance problems	-,056	-,024	**,869**	,309
perf_7 Risk of vendor not having the required knowledge to execute the order	-,123	,054	**,749**	,357
good_1 The vendor acts in our interest	,379	**,722**	-,087	-,077
good_2 The vendor is interested in our well being, not just in its own	,308	**,816**	-,038	-,097
good_3 The vendor cares about our company	,337	**,871**	-,026	-,021
good_4 The vendor is concerned about our interests	,288	**,886**	-,072	-,060
good_5 The vendor is sincere and genuine	,419	**,725**	-,037	-,053
rela_1 Risk of vendor not being cooperative	-,058	,009	,300	**,827**
rela_2 Risk of vendor demonstrating opportunistic behavior	-,002	-,123	,289	**,811**
rela_3 Risk of vendor demonstrating conflicting attitude	-,093	-,094	,280	**,870**
rela_4 Risk of vendor having hidden agenda	-,071	-,032	,252	**,843**
rela_5 Risk of enduring losses due to low commitment of vendor	-,054	-,039	,421	**,763**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 8 iterations.

Appendix B. Correlations

		Relational-risk 1	Relational-risk 2	Competence-trust 1	Competence-trust 2	Performance-risk 1	Performance-risk 2	Goodwill-trust 1	Goodwill-trust 2
Relational-risk 1	Pearson Correlation	1	,865(**)	-,167(*)	-,144(*)	,607(**)	,572(**)	-,169(*)	-,179(**)
	Sig. (2-tailed)		,000	,013	,032	,000	,000	,012	,008
Relational-risk 2	Pearson Correlation	,865(**)	1	-,132(*)	-,116	,658(**)	,627(**)	-,097	-,129
	Sig. (2-tailed)	,000		,050	,086	,000	,000	,150	,056
Competence-trust 1	Pearson Correlation	-,167(*)	-,132(*)	1	,916(**)	-,111	-,113	,679(**)	,695(**)
	Sig. (2-tailed)	,013	,050		,000	,099	,094	,000	,000
Competence-trust 2	Pearson Correlation	-,144(*)	-,116	,916(**)	1	-,100	-,101	,676(**)	,665(**)
	Sig. (2-tailed)	,032	,086	,000		,138	,136	,000	,000
Performance-risk 1	Pearson Correlation	,607(**)	,658(**)	-,111	-,100	1	,934(**)	-,128	-,134(*)
	Sig. (2-tailed)	,000	,000	,099	,138		,000	,058	,047
Performance-risk 2	Pearson Correlation	,572(**)	,627(**)	-,113	-,101	,934(**)	1	-,156(*)	-,130
	Sig. (2-tailed)	,000	,000	,094	,136	,000		,020	,053
Goodwill-trust 1	Pearson Correlation	-,169(*)	-,097	,679(**)	,676(**)	-,128	-,156(*)	1	,816(**)
	Sig. (2-tailed)	,012	,150	,000	,000	,058	,020		,000
Goodwill-trust 2	Pearson Correlation	-,179(**)	-,129	,695(**)	,665(**)	-,134(*)	-,130	,816(**)	1
	Sig. (2-tailed)	,008	,056	,000	,000	,047	,053	,000	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).