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How trust influences transactions in e-sourcing of logistics services: a conceptual framework

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Abstract

In business to business transactions, logistics services are often procured by means of electronic sourcing mechanisms, e.g. e-negotiation or e-reverse auction. The use of these mechanisms enables companies to reduce costs while conduct the transaction on a set of service attributes, such as price, quality, flexibility, and reliability. “Soft” factors characterizing companies’ behavior may impact the buyer-supplier relationship and the outcome of the transaction. A critical factor is trust, which facilitates collaboration and affects supply chain performances. By focusing on the e-sourcing of logistics services, this paper aims at analyzing how interpersonal trust and interorganizational trust between buyer and supplier affect transactions. It proposes a conceptual framework based on the literature review, which identifies the influence of trust on operational performances (e.g. price or utility) and relational performances (e.g. satisfaction) in e-sourcing.

Keywords: buyer-supplier relationship, e-sourcing, logistics service, trust.

1 Introduction

The adoption of e-sourcing mechanisms, such as online reverse auctions or online negotiations, has been extensively analyzed by the literature. Empirical studies have confirmed that these mechanisms enable companies to achieve great benefits in terms of purchasing costs reduction and improvement in the procurement process.

However, e-sourcing as opposed to traditional tools (such as face-to-face negotiation) has been also criticized for damaging the relationship between buyer and supplier. Due to the impersonal nature

of the online environment, e-sourcing mechanisms can be detrimental for collaborative relationships and can induce opportunistic behaviors.

This issue may be particularly critical in highly uncertain contexts, such as that of business to business services (Vickery et al., 2004). In this paper we consider the context of logistics services, characterized by high level of uncertainty and complexity. In fact, relationships between buyers and suppliers of logistics have changed over time moving from competitive to partnership approaches. Competitive approaches focus on the efficiency of the transaction by considering price as the main leverage; relationships are characterized by short-term arrangements and limited information sharing. At the opposite side, logistics partnerships are based on collaboration as well as risks and rewards sharing (Skjoett-Larsen, 2000). A critical factor in enabling the effectiveness of a logistics partnership is trust (Selviaridis and Spring, 2007). To implement and develop a successfully partnership it is necessary to establish a reliable and trustworthy environment, even in the initial steps of the relationship.

Given the importance of trust as prerequisite for successful logistics relationships, and the need to mitigate the potential negative impact of e-sourcing on such relationships, it is essential to further analyze the role of trust as influencing factor on both operational and relational benefits.

We address this issue by proposing a conceptual framework that analyzes how trust between buyer and supplier influences transaction performances in e-sourcing; then, the framework is discussed with regard to the specific context of logistics services.

The paper is organized as follows. Section 2 reviews the literature on logistics service, e-sourcing adoption, and trust in interorganizational relationships. Section 3 presents the conceptual framework and describes the theoretical constructs. Finally, Section 4 discusses the framework and the methodology that we envisage to test it.

2 Literature background

2.1 E-sourcing mechanisms

E-sourcing consists in the use of internet-based applications and decision support tools that facilitate the interaction among buyers and suppliers in various phases of the sourcing process, at both the strategic and operational levels.

Examples of e-sourcing mechanisms are on line reverse auctions and negotiations (Beall et al., 2003). A reverse auction is a bidding event between a buyer and several pre-qualified suppliers, who compete against each other lowering their bid amounts, until the lowest competitive bid is reached. The buyer controls the market (Smeltzer and Carr, 2003) and can make a comparison among the different suppliers. Reverse auction is characterized by short duration and constrained environment (there is no possibility to provide detailed clarifications during the auction), thus requiring the exchanged items to be clearly and unambiguously specified.

Among negotiation mechanisms, the most used are the request for proposal (RFP) and the request for quote (RFQ) (Beall et al., 2003). In an RFP the buyer asks the supplier to articulate how it would respond to a specific need. The request may only detail some performance characteristics for the needed item as well as the way in which the supplier should satisfy such needs; in some cases the request may include further detailed specifications and precise requirements. With an RFQ the buyer asks the supplier to quote a price based on more detailed requirements, terms and conditions of delivery, quality, payment terms, warranty, and any other important specifications.

E-sourcing tools yield savings in terms of purchasing price reductions and improvements in the procurement process (Handfield and Straight, 2003). They enables companies to decentralize operational procurement processes and centralize strategic ones as a result of high supply chain transparency (Puschmann and Alt, 2005). For example, reverse auctions reduce lead time associated with the sourcing process by eliminating some of the sourcing steps, and establish real time

competition that can result in significant cost savings (e.g. by identifying suppliers with excess capacity, who could then be willing to get a lower profit margin than their competitors).

However, the extensive use of e-sourcing as opposed to face-to-face transactions has been often criticized for involving greater responsibility for the buying company and damaging the relationships between buyer and supplier (Handfield and Straight, 2003). These phenomena arise from the impersonal nature of the online environment, the implicit uncertainty of using an open technological infrastructure for transactions, and the uncertainty due to the newness of the transaction medium (Pavlou, 2002).

The interface between e-sourcing and the interorganizational context in which it is deployed is an emerging research area. Most of the studies addressing this topic empirically analyze the way in which specific e-sourcing tools influence interorganizational behaviors and supply relationships (Carter and Stevens, 2007; Gattiker et al., 2007; Jap, 2003, 2007; Jap and Haruvy, 2008; Tassabehji et al., 2006) (Table A in Appendix).

Gattiker et al. (2007) focus on supplier's trust in buyer as an important outcome of the e-sourcing adoption. They analyze trust variation under different procurement conditions, which depend on the type of sourcing mechanism and the complexity of the procurement situation. Their experimental study reveals that in reverse auctions the levels of trust are lower than in both face-to-face and e-mail negotiations. Furthermore, higher levels of trust in reverse auctions are observed when the procurement complexity is low.

Jap (2003, 2007) and Carter and Stevens (2007) study how the buyer's auction design (e.g. described by the number of bidders or the price visibility) affects the buyer-supplier relationship. Jap's studies provide empirical evidence that reverse auctions result in higher suppliers' perception of the buyer opportunism than traditional sealed bid formats do. Suppliers generally dislike reverse auctions because they feel that the computer interface prevents them from informing buyers about non price attributes and thus causes their products to become commoditized (Jap, 2003). Laboratory

experiments conducted by Carter and Stevens (2007) demonstrate that suppliers' perception of the buyer opportunism is higher when the auction shows suppliers' relative ranks (rank-based visibility auction) rather than the current lowest bid (bid-based visibility auction); besides, higher perception of opportunism is associated with higher competitive scenarios, i.e. higher number of suppliers participating in the auction.

2.2 *Logistics services*

Most of the peculiarities of logistics services' procurement arise from the different nature of a service from that of a physical good. In the literature several attributes are proposed to explain the nature of the service concept, i.e. Lovelock's (1983) service dimensions: intangibility (it cannot be seen, tasted, or touched in the same way of a good); heterogeneity (it cannot be easily standardized); inseparability of production and consumption (as it is produced, a service is simultaneously consumed); and perishability (a service cannot be inventoried; if it is not consumed when available, then there will be no chance to stock it for future use).

With reference to business services, some studies emphasize the inseparability and the feature that they are produced and consumed in interactive processes between buyer and supplier. This interaction, which consists in the continuous dealings taking place between buyer and supplier even after the contract has been agreed, is mainly driven by the importance of the service for the final customer and the importance of the service for the buying firm itself (Wynstra et al., 2006).

Firms tend to believe that defining, measuring, and controlling performances is more difficult for services than goods; this may lead to inefficiency of the procurement process and to lack of control on services' spends (Fitzsimmons et al., 1998; Smeltzer and Ogden, 2002). Logistics services, which represent a major quota of such spends, are characterized by a high degree of complexity and uncertainty. Buyers often demand *advanced services*, namely bundles of multiple services or value-adding logistics solutions (e.g., integrated transportation and warehouse management, supply chain

inventory management, and reverse logistics), which significantly differ from *basic services*, namely single services characterized by a lower degree of customization (e.g., point-to-point transportation) (Andersson and Norrman, 2002).

As a consequence of logistics services innovation, the relationship between buyers and suppliers have changed over time moving from competitive to collaborative approaches. Competitive approaches are mainly adopted to purchase basic services; the focus of the relationship is on the efficiency of the transaction and the price is considered the main leverage. Conversely, the procurement of logistics solutions involves collaboration, information and data sharing, risks and rewards sharing, and joint investments in facilities and equipments, namely third-party logistics relationships (Berglund et al., 1999; Skjoett-Larsen, 2000).

The effectiveness of a logistics partnership heavily depends on social commitment and mutual trust (Selviaridis and Spring, 2007). Logistics partnerships are also characterized by a high level of complexity of organizational phenomena (Vickery et al., 2004) due to the uncertainty and difficulty of organizational tasks and the interdependence between partners (Daft and Lengel, 1984).

2.3 *Trust in interorganizational relationships*

In the literature the importance of trust in interorganizational relationships has been widely discussed and several definitions of trust have been proposed.

Ring and Van de Ven (1992) define trust as confidence or predictability in one's expectations about another's behavior, and confidence in another's goodwill (confidence that each party in the relation will fulfill its obligations and behave expectedly). Cumming and Bromiley (1996) view trust as an expectation that an individual or a group will (i) make a good faith effort to behave in accordance with any commitments, both implicit or explicit; (ii) be honest in whatever negotiations preceded those commitments; (iii) not take advantage when there is the opportunity. According to Doney and Cannon (1997), trust is the perceived credibility and the benevolence of a target trust. Sako and

Helper (1998) combine economic and social approach defining trust an expectation held by one agent that its partner will behave in a mutually acceptable manner.

The definition by Zaheer et al. (1998) seems to be one of the most comprehensive: trust is the expectation that an actor (i) can be relied on to fulfill obligations, (ii) will behave in a predictable manner, and (iii) will act and negotiate fairly when the possibility for opportunism is present.

Much of the work on trust in interorganizational relationships has been focused on the role of trust in reducing the transactions costs (Doney and Cannon, 1997; Sako and Helper, 1998; Zaheer et al., 1998). Consistently with the organization economics literature, transactions costs include the time and effort required to determine efficient transactions and arrive to agreements about the distribution of costs and benefits. Bounded rationality, uncertainty, and information asymmetry all contribute to increase costs of negotiation. Following this theoretical approach, researchers have hypothesized (and then empirically confirmed) a negative relation between trust and transactions costs: when interorganizational trust is high, agreements are likely to be reached more quickly and easily as parties are more readily able to arrive at a meeting point; parties are more flexible in granting concessions because of the expectations that the other party will reciprocate in the future. Trust reduce the inclination to guard against opportunistic behavior on the other party. In addition, a positive relation between trust and transaction performance (where performance is measured as the fulfillment in goals such as competitive price, timeliness of delivery, quality, flexibility, etc.) has been found too. These findings suggest that firms may derive competitive advantage from relationships based on high levels of mutual trust.

A further important issue is the multilevel nature of trust. A first level of analysis concerns *interpersonal* trust and *interorganizational* trust, which are different (both theoretically and empirically) but related constructs (Doney and Cannon, 1997; Zaheer et al., 1998). Interpersonal trust refers to the extent of an individual's trust in her counterpart in the partner organization; the individual is both the referent and the origin of trust. B2B interpersonal trust exists when an

individual in one firm trusts another individual within a different organization, e.g. the sales representative of supplier firm and the purchasing agent of buyer firm. Interorganizational trust describes the extent to which organization's members have a collectively-held trust orientation toward the partner firm, e.g. sales representative of supplier firm and buyer firm. A positive strong relation between interpersonal trust and interorganizational trust has been found: the more one trusts the supplier's representative individual with whom one deals, the more one's organization trusts the supplier organization and vice versa. There is a mutually reinforcing effect of trust at the two levels. A second level of analysis concerns *cognitive* and *affective* foundations of trust (Mc Allister, 1995; Sako and Helper, 1998; Møllering, 2002). Cognitive trust arises from knowledge and positive judgment that constitute evidence of another's competence and reliability. Affective trust arises from emotional links and sense of feeling among individuals.

3 Conceptual framework

The literature review above discussed has emphasized the key role that trust plays in business relationships.

Benefits of trust are frequently invoked in interorganizational research to account for the effect of cooperative relationship behaviors on performance. Trust can foster greater collaboration (Johnston et al, 2004) and richer information exchange. It has also a positive impact on firm innovativeness and supply chain performance (Panayides and Venus Lun, 2009). High levels of trust in the counterpart lead companies to behave so as to achieve higher performance: trust enables the parties to focus on the long-term benefits of the relationship enhancing competitiveness and reducing transaction costs (Doney and Cannon, 1997; Zaheer et al., 1998).

In the context of e-sourcing, which is characterized by higher uncertainty and complexity than in face-to-face transactions, it is more likely that relationships be deteriorated and performances diminished (Handfield and Straight, 2003): trust becomes then an important asset to buyers and

suppliers. For example, Gattiker et al. (2007) argue that when using e-mail negotiation or e-reverse auction, supplier's perception of buyer's honesty positively affects supplier's desire to have future interaction with the buyer. Similarly, Jap (2003) claims that low levels of trusts between the parties might lead to opportunistic behaviors, causing in turn lower performance in terms of product quality and service level.

We address such issues by in depth analyzing the impact of trust in the adoption of e-sourcing. The basic idea is that the impact of e-sourcing mechanism on the outcome of the transaction is influenced by the level of trust characterizing both buyer and supplier. The conceptual framework representing these links is depicted in Figure 1.

Below we describe every construct of the framework as well as discuss the later with specific reference to the e-sourcing of logistics services.

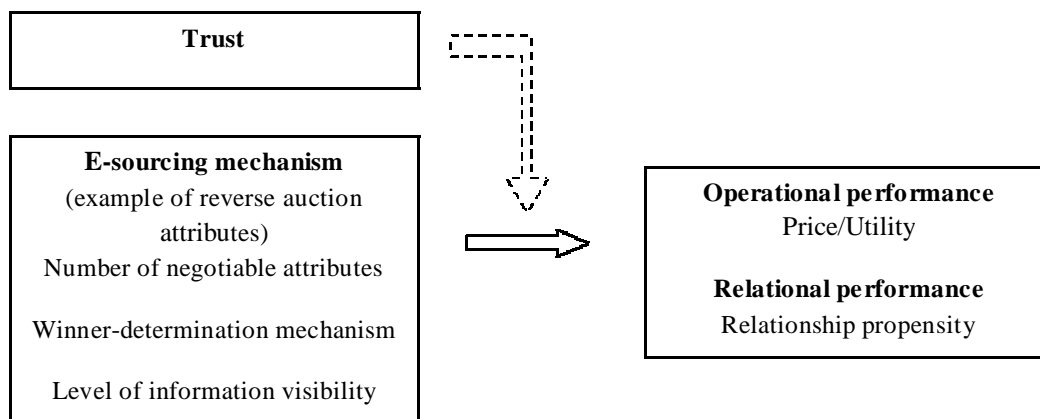


Figure 1. Conceptual framework of trust influence on performance in e-sourcing

3.1 *E-sourcing mechanism*

E-sourcing mechanisms can be designed along several dimensions (Kauffman and Carter, 2004). For example, if a reverse auction is considered, the mechanism may be characterized by:

- Number of negotiable service attributes: the transaction can be conducted on a single attribute of the service or on a set of attributes. When a buyer needs to procure a standardized item or he is able to define all the features of the item to the potential supplier, price is essentially the only negotiable attribute, and thus the fundamental performance measurement. When the buyer demands an heterogeneous service the transaction can be conducted on several negotiable attributes.
- Winner determination mechanism: at the end of the transaction, the buyer may commit to award the contract to the supplier offering the best bid (e.g. the lowest price) or it may reserve the right to select the winner based even on a further evaluation that takes into account additional features of the potential supplier (e.g. supplier's IT capability or value-adding service capability).
- Level of information visibility: the buyer may decide to show potential suppliers more or less information. Suppliers may be informed about their relative rank or only about their bid value. In multi-attribute auctions suppliers may know how the buyer weighs the importance of the service attributes or not.

3.2 Performances

Performances of the transaction are distinguished into two categories: performance concerning *operational* elements and performance concerning *relational* elements (Stank et al., 1999).

Operational performances are strictly related to both effectiveness and efficiency and may be measured by a *utility function*. The latter utility function considers a set of parameters that identify the attributes of the service that can be negotiated in the e-sourcing event. Buyers and suppliers have their own preferences about service quality, price, delivery times, quantity flexibility, etc., and they look for the offer that best satisfies these preferences (Table 1).

Table 1. Parameters that define the operational performance

Service attribute	Example
Price	Transportation price for a given quantity
Delivery frequency	Frequency of deliveries within a given supply period
Flexibility	Possibility to change order details (e.g. flexibility on total freight quantity or on delivery frequency)
Reliability on service level	Minimum percentage of guaranteed on-time deliveries
Warranty	Warranty conditions on freight damage

Relational performance is related to “the extent of activities and behaviors directed toward initiating, developing, and/or maintaining successful industrial relational exchange” (Morgan and Hunt, 1994). We measure the relational performance in terms of *relationship propensity* (Jap and Haruvy, 2008), namely the suppliers and buyers’ intention and expectation of developing a long-term relationship. In particular, Jap and Haruvy (2008) measure the relationship propensity for incumbent suppliers through the satisfaction with their ongoing relationship with the buyer.

Satisfaction is a key performance outcome, resulting from the evaluation of all aspects of the relationships between the parties (Sanzo et al., 2003). It is a perception that follows the conclusion of a negotiation and influences future behavioral intentions, i.e., the likelihood that the parties will negotiate in the future (Oliver et al., 1994). Differently from the incumbent ones, new potential suppliers can only possess a propensity to develop an ongoing relationship based on the experience of the current transaction.

3.3 *Trust*

With regard to *trust*, we consider its role as behavioral factor that influences the performance of the transaction. Trust is the expectation that the other party will behave in a predictable and reliable manner and will not act opportunistically. When supplier and buyer negotiate in a trustful

environment, they will be more willing to reach a mutual beneficial agreement. They expect that the counterpart will be honest and benevolent during the transaction. Parties are more flexible in granting concessions because of the expectations that the other party will reciprocate in the future. Trust reduce the inclination to guard against opportunistic behavior on the other party.

In addition, we consider the multitier nature of trust: firstly, interorganizational trust and interpersonal might differently impact performances; besides, trust at both levels might have cognitive components and/or affective components (Table 2). During the transaction, buyer and supplier process and exchange signals (both explicitly and implicitly) which contributes to the development of cognition- or affect-based trust (Huang et al., 2007).

Table 2. Levels and components of trust

Level of trust analysis	Trust component
<i>Interorganizational trust</i>	<p><i>Cognition-based elements</i></p> <p>Past work experience between organizations</p> <p>Task advice ties</p>
<i>Interpersonal trust</i>	<p><i>Cognition-based elements</i></p> <p>Past work experience between individuals</p> <p>Non-verbal social cues</p> <p>Task advice ties</p> <p><i>Affect-based</i></p> <p>Friendship and further affective bonds</p>

For example, cognitive elements can be found in the evaluation of non-verbal social cues because the interpretation of non verbal signals increases an individual’s ability to predict, evaluate and asses the other party’s intention and possible behavior (Doney and Cannon, 1997). Also, cognitive processes arise from task advice ties (Chua et al., 2008), that are channels through which an individual obtain resources such as information and guidance about activities basing on competence

and expertise of the counterpart. Friendship links may be positively related to affective-based trust since friendship enhances cooperation and facilitate communication (Chua et al., 2008). Conversely, affective elements of trust seem to be not particularly relevant within interorganizational links.

4 Discussion and future research

The literature background suggests that when a buyer trusts his supplier, he will feel secure due to an implicit belief that the actions of the supplier will result in positive outcomes. Trust serves as fundamental driver of satisfaction with relationship and desire for continuity of the relationship, in particular when the parties move towards partnership.

Therefore, especially when sourcing is supported by e-mechanisms, we might expect a positive impact of trust on the relationship propensity. Companies might derive competitive advantage from supply relationship based on higher levels of trust; trust might be considered a powerful way to improve performance and develop long-term relationships.

Furthermore trust exists at different levels (interorganizational and interpersonal level) and develops through different processes (cognitive and affective processes), thus the relationship propensity could be differently affected depending on the type of trust between the parties.

On the contrary, it seems not trivial to predict which is the impact of trust on the operational performance when e-mechanisms are utilized for sourcing. The literature suggests indeed that e-sourcing positively impacts on operational performance. However, when trust is high the parties could be too confident with the relationship, which could results in a lower effort to achieve high operational performance.

With regard to the future steps of this research, our aim is to empirically investigate how trust might impact on operational and relational performance in the e-sourcing of logistics services. Behavioral experiments may be a powerful tool to this end. They are a research methodology adopted to study

human factors issues in many fields, including economics and business disciplines, such as marketing, accounting, and management (Bendoly et al. 2006). Considering the environment of the experiment itself, it is possible to identify three categories of behavioral experiments: 1) industrial experiments, which involve real workers performing authentic tasks; 2) laboratory experiments, which involve subjects in a controlled and often stylized version of authentic tasks; 3) situational experiments, which give subjects a description of their tasks and ask them to answer some questions about how they would behave in such a situation.

To test the conceptual framework of this paper, laboratory experiments may be used. The assumption of laboratory studies is that theory being tested within the laboratory applies in real-world situations and to actors outside the laboratory. Their primary advantage is that they provide a high degree of control over threats to internal validity, that is extraneous factors that might affect the observed relationships between independent and dependent variables (Campbell and Stanley, 1963). They are sometimes criticized for the lack of contextual realism, since they use students instead of real representatives of the population under study. However, as noted by Bendoly et al. (2006), “this can be a valid criticism if the phenomena under study heavily depend on the individual life experiences of the subjects”. The aim of experiments is not to test the subjects involved in the study, rather whether they react in a predictable manner as representative of real subjects.

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6 Appendix.

Table A. Empirical studies on interorganizational relationships in e-sourcing

Focus/Research questions	Relational aspects	Methodology	Key findings	Study (Reference)
The effect of e-reverse auction on buyer-supplier relationship	Supplier's suspicion of opportunism Supplier's willingness to make idiosyncratic investments	Survey	The increase in supplier's suspicion of opportunism is greater in open-bid than in sealed-bid auction for both incumbent and new suppliers. In sealed-bid auction supplier's willingness to make idiosyncratic investments increases after the auction, while in open-bid auction it does not change	Jap (2003)
The effect of e-reverse auction on buyer-supplier relationship	Supplier's suspicion of buyer opportunism. Supplier's willingness to share future saving resulting from technological improvements Supplier's discontent with certain practices	Multiple case studies	Suppliers are unwilling to share future savings with buyers and might be willing to retaliate. Incumbent suppliers' attitude to the buyer may worsen regardless of whether the supplier loses the auction. Suppliers are discontented with bidder qualifications and suspicious of phantom bidding, exploitation of incumbents, lack of clarity and completeness of product specifications.	Tassabehji et al. (2006)
The effect of variations in the structure of an e-reverse auction on buyer and supplier outcomes.	Supplier's perception of buyer's opportunism	Laboratory experiments	In e-reverse auction: i) supplier's perception of buyer's opportunism is higher in the case of rank-based visibility structure than in the case of price-based visibility ii) supplier's perception of buyer's opportunism is higher in the case of high level of supplier's need for the contract than in the case of lower level of supplier's need ii) supplier's perception of buyer's opportunism is higher when the number of participating suppliers in the auction is higher rather than lower	Carter & Stevens (2007)

Impact of information richness of sourcing channels (face-to-face negotiation, e-mail negotiation, e-reverse auction) on buyer-supplier trust; influence of the complexity of the procurement situation on the relation between information richness of sourcing channels and buyer-supplier trust	Supplier's trust in buyer (honesty trust and benevolence trust)	Experimental simulation in laboratory settings	E-reverse auction is associated with lower level of supplier's trust than is face-to-face negotiation, regardless the level of procurement complexity. E-reverse auction is associated with lower level of supplier's benevolence trust than is e-mail negotiation, only when the level of procurement complexity is high. E-mail negotiation is associated with higher level of supplier's trust in high procurement complexity situations. E-reverse auction is associated with higher level of supplier's honesty trust in lower procurement complexity situations. Honesty trust positively affects supplier's desire for future dealings with the buyer.	Gattiker et al. (2007)
The effect of e-reverse auction design and structure on the buyer-supplier relationship	Supplier's perceptions regarding: suspicion of buyer's opportunism, overall satisfaction with the relationship, continuity expectations	Survey	The number of bidders increases suspicion of buyer's opportunism; increasing the number of bidder up to approximately 12 positively affects supplier's satisfaction. The higher is the contract value, the higher is satisfaction and continuity expectation. As the number of lots increase and an auction determined rule is adopted, suspicion of opportunism is reduced. In auction with rank-visibility supplier's satisfaction is higher than in auction with full price-visibility.	Jap (2007)
The effect of supplier's relationship propensity prior to the e-auction on bidding aggressiveness; the effect of bidding aggressiveness on buyer-supplier relationship after the auction	Supplier's relationship propensity (satisfaction with relationship for incumbent suppliers and willingness to develop solidarity for new suppliers)	Survey		Jap & Haruvy (2008)