Relationship Governance Impact on Performance Outcomes in Buyer-Supplier Relationships

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Abstract

Our research investigates the effect of buyer-supplier relationship governance mechanisms on performance outcomes. We propose trust, commitment, and communication as the key determinants of buyer-supplier performance outcomes. With use of regression, moderation, and mediation analyses we empirically test the hypothesized relationships using a sample of 95 Dutch firms from the maintenance service industry. The results provide strong support for effects of trust, commitment, and communication on quality improvement and customer satisfaction. Additionally, we examine inner-effects between the predictors and effects of different contract types. Our final implication is that trust and commitment mediate the effect of communication on performance outcomes.

Keywords: Purchasing management, Buyer-Supplier Relationship, Relationship Governance, Behavior-Based Contracts, Trust, Commitment, Communication.
Submission category: Working paper

1. Introduction

Today, in order to stay competitive, companies must understand the importance of innovation and quality improvement. Continuous improvements of both products and business processes are considered key to the survival of companies (Irani et al. 2004). Competitive advantage no longer depends only on the firm's internal capabilities, but increasingly on its relationships with external organizations. Therefore, supply chain management is identified as a source of competitive advantage and is recognized as a key business driver (Van Weele, 2005). It was shown that high performing companies manage their supply base as a strategic resource. Supply chain partners are focused on working towards mutual gain, shared value, and total lifecycle costs reduction. However, in order to effectively manage supplier relationships, effective governance mechanisms should be in place (Williamson, 1996). Successful collaboration between buyer and supplier requires both effective formal and informal governance. The former helps to formally hedge from unforeseeable situations and losses arising from the hazards of exchange by use of various contract types. The latter relates to the social components of the buyer-seller relationship i.e. trust, commitment, and communication (Artz et al. 1998, Kwon et al. 2005, Paulraj et al. 2008). Our research investigates how different levels of both formal and informal governance mechanisms influence the performance outcomes of buyer-supplier relationships (Carson et al. 2006, Yu et al. 2006). More specifically, two research questions are addressed:

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Question 1: How does relationship governance influence buyer-seller performance outcomes in terms of customer satisfaction, reduced costs and quality improvement?

Question 2: How do fixed price and cost plus contracts affect the influence of the relationship governance on buyer-seller performance outcomes?

2. Supplier Relationships

Over the last decade, buyer-supplier relationship management has received significant attention as the one that allows for a long-term strategic orientation and maximization of competitiveness (Chen, 2006). Companies experience a strong need in a trustful and a long-term oriented relationship with their suppliers. The quality of such relationship is significantly higher when both partners share risks and mutual goals, trust each other and become committed to the success of each other (Parsons, 2002). However, in particular cases, short-term relationships can be more effective and optimal for partners (Cohen et al. 1999). The current research explores the effects of buyer-supplier relationship governance on firm performance outcomes. Ho (2010) states that selection of the right suppliers and, moreover, establishing and maintaining an effective long-term relationship is of strategic importance. In order to be a world-class competitor, a company must build on the expertise and commitment of its suppliers. High levels of trust and cooperation are required. Therefore, those who advocate a partnership approach suggest companies to select partners wisely and encourage trust and commitment. The collaboration grows from recognition of the interdependence and the need to reduce uncertainty between both parties. It is built on minimizing the destructive potential of conflict, adopting communication and work patterns that leverage the strengths of the partners (Spekman, 1988).

Today, the purchasing function is increasingly seen as a strategic domain in organizations. Fostering effective, long-term supplier relationships are key to supply chain management. Such relationships are considered as an important asset in competitive strategy. Long-term relationships are required to build trust and mutually shared values (Chen et al. 2006). In addition it allows the supplier to invest in customer specific assets. Hence, the firm benefits from access to specific supplier technology, increases its own knowledge and shares strategic information with the supplier, which fosters sustained quality of the relationship (Parsons, 2002). Therefore, supply chain managers should build strong and long-term supplier relationships and carefully select the right supplier. When selecting suppliers, the performance of potential suppliers has to be evaluated against multiple criteria such as company's image, size and history, recent partners and accomplishments and more (Ho et al. 2010).

3. Buyer-Supplier Relationship variables

Two dimensions seem to determine the quality of the relationship with the supplier: 1) trust, which alleviates risks and 2) satisfaction, which refers to the degree in which expectations with regard to the performance of both parties are met (Parsons, 2002). This author considers two sets of variables, which determine the quality of the relationship: 1) interpersonal variables (similarity and shared values, communication, risk handling) and 2) relationship variables (mutual goals and commitment). Here, shared values concern the perceived degree of similarity between the buyer and the seller. They are at a higher level when both parties have equal views on the collaboration and both understand the advantages of such collaboration. Information sharing of production schedules, quality and strategic plans typically characterize

such collaboration. Communication explains how partners perceive each other, while risk handling explains the amount of comfort between both parties in case of disputes and conflicts. Mutual goals commitment relates to the willingness to maintain the relationship and accomplish goals together (Parsons, 2002). Consequently, the main objective of supplier selection process is to minimize purchasing risks, maximize overall value and build valuable, close and long-term relationships with the supplier (Chen et al. 2006).

4. Relationship Governance

In their study, Carr et al. (1999) demonstrate that firms who put higher priority on strategic purchasing and supplier evaluation systems are successful in terms of financial performance. Another author looked at the problem of relationship governance from the organizational learning perspective (Kohtamäki, 2010). He argues that as a joint activity between buyer and supplier, i.e. relationship learning leads to information and knowledge sharing between parties. Such relationship is long-term based and implies social interaction between individuals that are active in the relationship. Kohtamäki (2010) suggests that effective relationship governance requires several mechanisms to govern a single supplier relationship. Hence, a buyer can manage a supplier's behavior by applying three different relationship governance mechanisms in different combinations. These mechanisms include price, hierarchy (in terms of authority, structures and processes in relationship) and social aspects. Social governance implies trust and interaction and is seen as significant element for relationships. However, it is inadequate without other mechanisms (Kohtamäki, 2010). Similarly, Van Weele (2005) suggests task and non-task variables that affect the buying decisions in organizations. The former are related to the tasks, responsibilities and competences assigned to the person involved in purchase decision-making process, while the latter are more related to the personality of an employee involved in that process.

Paulraj et al. (2008) introduce the notion of *relational competency* from the relational view of strategic management. The term describes inter-organizational communication among supply chain members. They suggest that in order to build sustainable strategic advantage, firms need to adopt a collaborative managerial mindset. By cooperating with supply chain partners, companies are able to acquire greater economic benefits. Open communication between partners may lead to inter-organizational learning, better understanding, greater confidence, reduced conflicts and increased trust, which is crucial for competitive success (Paulraj et al. 2008). Relational variables underlying buyer-supplier relationships also find support in the article of Artz et al. (1998), who argues that higher levels of trust and cooperation behaviours foster firm performance. Collaboration between buyer and supplier and their commitment to their relationship fosters information sharing, joint planning and problem solving. It helps to avoid opportunistic behavior and anticipates environmental uncertainties. Consequently, closer buyer-supplier relationships create mutual dependency, better cooperation and results in increased performance of both partners (Artz et al. 1998). Humphreys et al. (2004) discusses supplier development as an important driver of a buying company's competitive advantage, which implies various efforts to increase the capabilities and performance of the supplier. It was found that firms who advocate higher levels of open and frequent communication with suppliers tend to be more satisfied with their suppliers. This may be due to higher levels of supplier commitment and long-term relationship expectations (Humphreys et al. 2004).

5. Governance mechanisms

Two types of governance mechanisms have been discussed in literature: 1) *formal governance mechanisms* that correspond to financial commitments and contracts between exchange partners, and 2) *informal governance mechanisms* that correspond to relational perspective of relationship between partners (Carson et al. 2006). Transaction Cost Economics suggests the use of legal contracts or formal structures in order to mitigate all possible risks and other unpredictable eventualities (Yu et al. 2006). In line with this discussion Eisenhardt (1985) suggests to differentiate between behaviour based contracts and outcome-based contracts, depending on the degree of control the buyer wants to have over supplier's behaviour and outcomes.

Formal Governance Mechanisms

With use of the contracts and financial commitments, partners can explicitly agree upon possible unforeseeable situations and mutual obligations, thereby, protect themselves from losses arising from the hazards of exchange (Williamson, 1985). Celly et al. (1996) suggests that control over the agent can be achieved by behaviors or outcomes. However, less controlled supplier behavior may result in innovative project solutions for the agent. Higher levels of supplier autonomy characterize outcome-based contracts. They leave more freedom for the supplier to make its own decisions and to find improved ways for the project execution, while the principal only focuses on the expected outcomes (Johnson, W. H., & Medcof, J. W. 2007; Wang et al., 2011). Hence, outcome-based contracts are preferable when organizing for radical innovation. The agent decides, depending on its capabilities and potential payoff, whether to undertake the project or to refuse to work for the principal. The main problem of such contracts is the risk that is shifted to the agent, as well as associated costs of that risk (Bergen et al. 1992).

Informal Governance Mechanisms

Eisenhardt (1985) argues that behavior-based governance mechanisms are more appropriate under conditions of high uncertainty. Moreover, in case of high value added relationship, the behavior-based governance mechanism seems the most preferable. It can increase the level of trust and allow sharing the risks between exchange partners (Celly et al. 1996). Ng et al (2013) argues that cooperation can be achieved by optimal combination of both formal and relational governance mechanisms. The former allows to contractually agreeing upon responsibilities and obligations of parties, while the latter allows for more flexibility and better adaptation under conditions of environmental change. Formal mechanisms seem to contribute less to development of trust between parties (Ng et al. 2013). While the informal mechanisms rely more on social components: reputation, continuity, relationship longitude and trust (Yu et al. 2006; Carson et al. 2006).

6. Contract types

Outcome based contracts are rather focused on the performance and on achieving the required results of the buyer-supplier relationship. Whereas behavior based contracts seem particularly focussed on the social aspects of the buyer-supplier relationship. Therefore, two main types of contracts that correspond to the relational governance will be of interest for this research: 1) fixed price and 2) cost plus contracts (Turner et al. 2001). When a fixed price contract is used, the agent is paid a fixed price for the entire job. This price needs to be agreed by the principal and agent in advance. In case of cost plus contract, the agent is paid all the expenses plus agreed profit margin.

Turner et al. (2001) suggests that the fixed price contracts should be used when the level of risk is low, while the cost plus contracts should be used in case of high level of risk. Fixed price contracts shift all risks to the supplier, while cost plus contracts shift all risks to the buyer (Müller et al. 2005). Moreover, what type of contract to use depends on the level of uncertainty. When the buyer is willing to accept a high level of uncertainty, cost plus contracts seem most appropriate. Fixed price contracts are more suitable in cases when the buyer wants to accept a low level of uncertainty.

7. Trust in buyer-supplier relationship

In his work, Zaheer et al. (1998) state that trust grows from experience of cooperation with a partner. Trust is the expectation that the partner will act predictably and fairly in case of opportunism opportunity, which means that a trusted partner can be relied on. Fink et al. (2010) argue that trust is the most important factor of high performing partners, because it grows from the commitment to cooperation and improves the actual quality of the relationship. Other authors argue that (Aulakh, et al. 1996), trust motivates partners to go for a long-term relationship. Finally, trust is a mutual belief in fair behavior and obligations fulfilment (Aulakh et al. 1996). We will therefore consider trust in this way for the rest of our research. Trust can be defined as a core element of sustainable and effective buyer-supplier collaboration. Trust may reduce transaction cost, minimize relationship control and eliminate various hazards of exchange. Trust is an essential element of the long-term buyer-seller relationship. It is seen as a belief that the relationship with the exchange partner will result in positive outcomes and will avoid unforeseeable actions or hazard such as opportunism (Kwon et al. 2005; Pavlou et al. 2006). Humphreys et al. (2004) discusses trust as an alternative to a formal contract, because it may with less risk and costs help to avoid hazards of opportunism. Trust is also reflected in a willingness of partners to take risk or to put confidence in the exchange partner's capabilities. However, unlike confidence, trust requires the existence of successful exchange experiences with the partner in the past. Trust will eliminate the need to monitor or control the relationship. Hence, relational governance mechanisms may effectively substitute formal governance mechanisms (Kwon et al. 2005, Yu et al. 2006).

8. Commitment in buyer-supplier relationship

Commitment can be defined as a belief that the relationship with the exchange partner is extremely important. Commitment is shown in a willingness to support and maintain this relationship (Kwon et al. 2005). Artz et al. (1998) suggest that commitment implies the extent to which partners expect their current relationship to continue in the future. Higher levels of commitment to the relationship correspond to the long-term relationship between buyer and seller (Artz et al. 1998). Evidently, commitment can be seen as another vital element of the buyer-seller relationship.

9. Communication in buyer-supplier relationship

Communication can be defined as formal and informal process of sharing important information between firms (Anderson, J. C., & Narus, J. A. 1990). Successful supply chain relationships require continuous, two-way communication between exchange partners, which should be implemented in order to lower the level of uncertainty (Kwon et al. 2005). Paulraj et al. (2008) suggest that if a buyer and a supplier effectively communicate on a regular basis, product- and performance-related errors may be reduced. Moreover, cost savings may be increased and the product quality can be improved.

10. Performance outcomes

Although performance in the context of collaborative exchange has been covered widely in literature, most authors do not explicitly discuss performance outcomes in their research. In some papers, performance occurs in the form of a firm's financial rewards and well-being and is seen as the main critical performance indicator of a convenient and valuable buyer-supplier relationship (Carr, A. S., & Pearson, J. N. 1999). In other instances, performance is described as an extent to which a firm increases its competitive advantage and superiority. Most authors consider performance as a one-dimensional (financial) measure.

Artz et al. (1998) argue that nowadays performance is evaluated in terms of customer satisfaction, delivery performance, and transaction costs. Spekman (1988) adds to the discussion by stating that performance can also be measured in terms of quality improvement, competitive position and total cost of manufacturing. Three performance indicators seem to be of interest for our current research: 1) Customer satisfaction, 2) Cost reduction, and 3) Quality improvements.

11. Research framework

The discussed concepts and variables are summarized and illustrated in our analytical framework. *Figure 1* demonstrates the research objective of the present study. The logic behind our framework is as follows. From the literature it was found that relationship governance implies high levels of trust, commitment and communication (Artz et al. 1998, Celly et al. 1996, Kohtamäki 2010, Kwon et al. 2005, Paulraj et al.

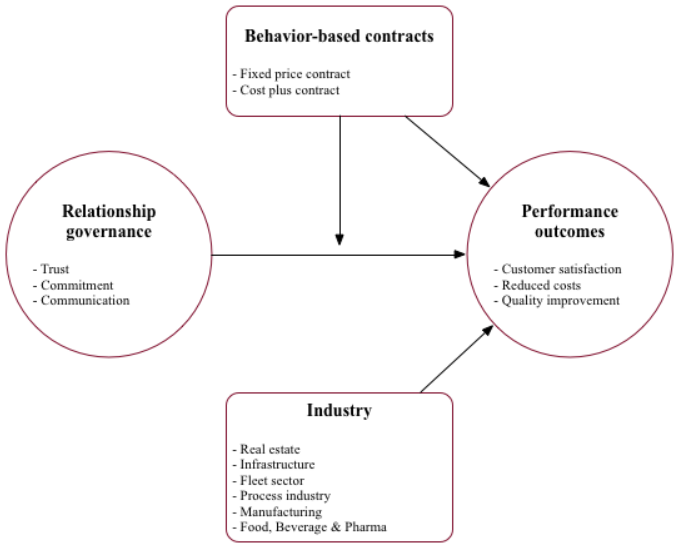


Figure 1 – Research framework

2008, Spekman 1988, Yu et al. 2006). Relationship governance, in turn, has an impact on the firm's performance outcomes (Artz et al. 1998, Humphreys et al. 2004). The contract type is hypothesised to moderate the direct effect of relationship governance on performance outcomes as well as directly influences the performance of buyer-supplier relationship (Artz et al. 1998; Celly et al. 1996; Krishnan et al. 2006; Kwon et al. 2005; Müller et al. 2005; Paulraj et al. 2008, Turner et al. 2001; Turner & Simister 2001). Finally, the results may vary for different maintenance industry sectors due to the origins of the research survey results.

12. Data Collection and Sample Selection

A survey of buyer-seller relationships among the Dutch maintenance industry was used to collect the data for this study. We selected both buying and selling firms as a unit of inter-organizational relationships analysis. Both buyers and sales executives were respondents in our survey. The data was collected in 2013 from the members of the Dutch Association for Maintenance Services (Nederlandse Vereniging voor Doelmatig Onderhoud, NVDO). An online survey was prepared and distributed over the asset owners (i.e., buyers of maintenance services, total of 430 members) and the providers of maintenance services (total of 430 members). Both the asset owners and service providers operate in one of six maintenance sectors (i.e., real estate, infrastructure, fleet (excluding passenger cars), process industry, manufacturing, and food, beverage, & pharmaceuticals). We focused on both the buyers' and the sellers' of maintenance services perspective in order to obtain a complete image of the inter-organizational relationship and to better understand the phenomenon we are studying. As result, 169 questionnaires were received from asset owners and service providers, with an overall effective response rate of 19.7% (169/860). Of the 169 responses, 74 were discarded due to excessive missing information. Consequently, a final usable dataset of 95 responses was used for analysis. The final sample included 48 supplying firms (50.5%) and 47 asset owners (49.5%).

13. Research findings and analysis

Prior to the actual analysis, our measurement model was assessed for internal validity and reliability, while the scales were tested for normality of residuals assumption as well as on a presence of outliers. The data summarization and reduction was required in order to have a smaller set of composite dimensions of variables. But prior to this, we checked for the appropriateness of the variables for factor analysis (Appendix A, B, C, D, E). We then tested our research framework with use of the multiple regression analysis technique as the most widely used technique by researchers in business, marketing, and economics modeling (Hair et al. 2009). The results of the multiple regression analysis for direct effects are given in the Table 1.

Table 1 - Direct effects and moderation in linear regression analysis

	Basic model			**Extended model**		
Predictor	**Dependent variable**			**Dependent variable**		
(Direct effects)	Cost reduction	Quality improvement	Customer satisfaction	Cost reduction	Quality improvement	Customer satisfaction
Trust_Commitment	.153	.211*	.242**	.221	.261*	.421**
Communication	.167	.211*	.212*	.112	.248	.164
Supplier (vs Buyer)	.535**	.515**	.508**	.535**	.522**	.487**
Fixed price contract	.015	.109	.202*	.015	.114	.200*
Cost plus contract	-.065	-.073	.090	-.065	-.075	.095
Infrastructure	-.104	-.086	-.096	-.109	-.118	-.083
Fleet	.064	.040	.060	.059	.031	.059
Process industry	.170	.095	.105	.165	.084	.079
Manufacturing	.099	.049	.002	.093	.047	.003
Food, beverage & pharm.	.004	-.054	-.054	-.010	-.070	-.061
(Moderating effects)						

Interaction (Trust_Commitment X Fixed price contract)				-.090	-.116	-.167
Interaction (Trust_Commitment X Cost plus contract)				-.028	-.011	-.140
Interaction (Communication X Fixed price contract)				.076	-.017	-.050
Interaction (Communication X Cost plus contract)				.004	-.068	.090
Variance explained (R^2)	.436(.000)	.460(.000)	.495(.000)	.444(000)	.472(.000)	.527(.000)

Note: **Beta-Values significant at p≤0.01; *Beta-Values significant at p≤0.05

Our first finding was that the underlying construct implied both trust and commitment (*Appendix B*). We therefore judged these two constructs as one in our analysis. Further, we found statistically significant effects of Trust_Commitment on Customer satisfaction (at the 0.01 level) and on Quality improvement (at the 0.05 level). Standardized regression coefficients (Beta) were used to compare between the effects of independent variables on dependent variables (Hair et al. 2009). The effect of Trust_Commitment is at highest on Customer satisfaction (b=.242, t=2.936; p≤0.01). Trust_Commitment has a moderate effect on Quality improvement (b=.211; t=2.477; p≤0.05).

Next to it, three different models were constructed with Cost reduction, Quality improvement, and Customer satisfaction as dependent variables (*Table 1*). The fit of the models was significant at the 0.01 levels. The models' explanatory power parameters (R^2=.436, R^2= .460, R^2=.495) explained 43,6% of the variance in Cost reduction, 46% of the variance in Quality improvement, and 49,5% of the variance in Customer satisfaction respectively. Variance inflation factor (VIF) and Tolerance coefficients for all of the independent variables were found to be at the acceptable levels, i.e. tolerance above 0.20 or 0.10 and VIF below 5 or 10 (Hair et al. 2009). These results suggested the absence of the multicollinearity in the models.

Moreover, our analysis revealed that the effect of Communication also appears to be significant only on two out of three measures of buyer-supplier performance. Here, the effect of Communication is stronger on Customer satisfaction (b=.212; t=2.549; p≤0.05) and is moderate on Quality improvements (b=.211; t=2.453; p≤0.05). We included two dummy variables and their interactions with communication into our basic model in order to test the effects of behavior-based contracts on performance outcomes but we didn't find any statistically significant results (*Table 1 - Extended*). We also tested the strengthening moderating effect of fixed price and cost plus contracts on the effect of trust and commitment on performance outcomes but likewise the results were statistically non-significant. Finally, in order to avoid any distorting effect of dummy variable for the type of the firm (i.e., Supplier vs. Buyer), we analyzed our model in isolation from other predictors, including only the effects of the corresponding individual predictors and their interactions with Trust_Commitment and Communication respectively. This resulted in two separate models.

As we can see in Table 2, none of the moderating effects on communication are significant. The only significant effects are: 1) the moderating effect of cost plus contract on Trust_Commitment in the effect on the customer satisfaction (b=-.246; t=-2.095; p≤0.05), and 2) the effect of the fixed price contract on customer satisfaction (b=.202; t=2.389; p≤0.05). However, the cost plus contract weakens the effect of trust and commitment. For the rest of the effects, the regression analysis didn't provide significant moderating effects of the behavior-based contracts.

Table 2 - Moderating effects in linear regression analysis

Predictor	**Dependent variable**			**Tolerance**	**VIF**
(Moderating effects on Trust_Commitment)	Cost reduction	Quality improvement	Customer satisfaction		
Trust_Commitment	.370*	.427**	.552**	.453	2.209
Fixed price contract	.026	.123	.212*	.892	1.122
Cost plus contract	-.062	-.090	.069	.890	1.124
Interaction (Trust_Commitment X Fixed price contract)	-.138	-.173	-.212	.592	1.688
Interaction (Trust_Commitment X Cost plus contract)	-.098	-.089	-.246*	.657	1.521
Variance explained (R^2)	.078(.196)	.130(.027)	.191(.002)		
(Moderating effects on Communication)					
Communication	.072	.232	.200	.477	2.097
Fixed price contract	.033	.133	.223*	.892	1.121
Cost plus contract	-.046	-.070	.091	.890	1.123
Interaction (Communication X Fixed price contract)	.041	-.058	-.119	.614	1.629
Interaction (Communication X Cost plus contract)	.101	.003	.145	.681	1.469
Variance explained (R^2)	.032(.707)	.073(.234)	.120(.041)		

Note: **Beta-Values significant at p≤0.01; *Beta-Values significant at p≤0.05

We also produced a plot, which represented the interaction effect of the cost plus contract and Trust_Commitment on the customer satisfaction (*Appendix F*). It appeared that when the cost plus contract is used, the change in the level of the Trust_Commitment doesn't affect the level of the customer satisfaction. This is due to the weakening effect.

Finally, we controlled for the effect of maintenance industry sector type on performance outcomes among the other predictors. The effect appeared to be non-significant on all three dependent variables (*Table 2*).

14. Revised research framework

Prior to the hypotheses testing, we expected to reveal three distinct theoretical constructs from the data, i.e. Trust, Commitment, and Communication. The analysis resulted in a combination of two (Trust_Commitment) and one single construct (Communication) (*Appendix B*). Though we found several significant effects of these constructs, stronger relationship between the constructs and the buyer-supplier performance outcomes could still exist in the data. We went back to the literature to

address the traces of possible hidden effects of Trust_Commitment and Communication on performance outcomes.

Having studied various articles we noticed a significant influence of open communication on various aspects of the buyer-supplier relationships. Moreover, Hoegl & Wagner (2005) suggested an inverted U-shaped relationship between communication and performance outcomes. Other research suggests that effective open communication increases buyer-supplier financial performance (Chen, Paulraj, & Lado, 2004), increases buyer-supplier commitment and long-term relationship expectations (Humphreys et al. (2004). And because we know that the long-term relationship breeds trust and commitment (Aulakh, et al. 1996; Fink et al. 2010; Zaheer et al. 1998), we directed our interest towards three following possible effects: 1) a possible curvilinear effect of communication on Trust_Commitment and performance outcomes, 2) a possible strengthening moderating effect of Communication on the effect of Trust_Commitment on Performance outcomes, and 3) a mediating effect of Trust_Commitment on the effect of communication on performance outcomes.

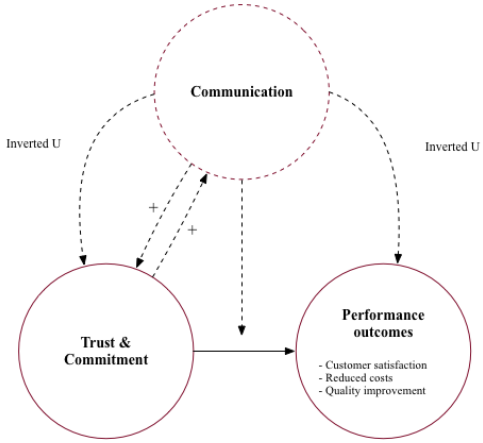


Figure 2 – Revised research framework

All these findings convinced us to come up with the revised theoretical model presented in Figure 2. We ran the factor analysis again but with an oblique factor rotation, which allows for factor correlations (Appendix C). Our first finding was the linear effect of Communication on Trust_Commitment. Our second finding revealed that communication does indeed have a curvilinear effect on Trust_Commitment in buyer-supplier relationship (*Appendix G, H*). We then tested the moderating effect of communication in a separate model, isolated from the other predictors. As presented in Appendix I, communication has no moderating effect on performance outcomes. Next to it, we tested the mediating effect of Trust_Commitment on performance outcomes. In doing the analysis, we used the method explained by Hayes (2014). Our first finding was that communication has an indirect effect on customer satisfaction. The next significant finding was the indirect effect of communication on quality improvement. Finally, the indirect effect of communication on cost reduction was found significant as well (Appendix J). So that we concluded that there is definitely a mediating effect of Trust_Commitment in effect of Communication on Performance outcomes.

15. Implications for research

This study contributes to existing purchasing literature in a few ways. First, it addresses the most important determinants of buyer-supplier relationships. It summarizes the notions of relationship governance in one single construct and discovers each of three theoretically meaningful concepts in particular. In doing so, this study puts together and discusses the importance of trust between exchange partners. It also considers no less important need for partners' commitment. Finally, the study describes the need for an appropriate amount of communication between buyer and supplier. In terms of this research, all three concepts frame the construct of relationship governance and are essential parts of it. Most importantly, the present study discovers the relationship between these three constructs and describes the importance of each of them in predicting the performance outcomes.

Second, the present study critically questions the meaning of buyer-supplier relationship performance. Prior to this study, the notion of performance was not concrete and used to diverge in meanings. All these meanings used to converge to the extent in which performance only represented either the financial rewards or firm's competitive position. We extended the understanding of buyer-supplier performance up to the level where not only the financial side is representative, but also the quality of product and processes, as well as the satisfaction of both sides and their customers. Indeed, we also enhanced the understanding of buyer-supplier performance in the financial perspective. In our work, it is discussed as the total costs of project (i.e., the cost of the product specification, process specification, variations to product during project delivery, and variations to process during project delivery) together with various transaction costs (i.e., the costs of planning, adapting, monitoring, and managing the contractual relationship) (Artz et al. 1998; Carr & Pearson, 1999; Gunasekaran et al. 2001; Ho et al. 2010; Janda et al. 2001; Turner & Simister, 2001; Spekman, 1988).

Finally, the present study complements to the contracting theory. It distinguishes between the effects of fixed price and cost plus contracts in governing the buyer-supplier relationships. The empirical evidence from both the literature study and the analysis resulted in constructive reasoning on the appropriateness of use of these contract types in different circumstances. This study suggests that cost plus contract is hazardous to performance between firms, because it weakens the positive effect of trust and commitment.

16. Implications for practitioners

The results of this study can serve as a valuable guide for managers of buying and selling firms, regardless of the maintenance industry sector. First, the present study undoubtedly suggests governing the buyer-supplier relationship as a valued source of performance. The research suggests managers of both buying and selling firms to enhance the levels of trust between organizations as well as help each other to become committed to success of each other. Sharing mutual goals on the project is the key instrument in avoiding interest disparities and is the lifeblood of the effective buyer-supplier relationships. Moreover, parties do not need to excessively control for the activities of the partner. This is especially true when the buying firm wants the best results in terms of costs and quality from the supplier.

This study also suggests the moderate levels of communication between exchange partners. Communication indeed influences mutual performance. However, too much communication may violate the effects of trust and commitment on firm performance. Therefore, firms need to communicate frequently in an open manner but

at the same time they should not cross the line of unnecessary communication (Hoegl & Wagner, 2005). Additionally, open communication will positively affect the level of trust and commitment between the partners, while increased levels of the latter constructs will have positive effect on performance.

Buying firms need to be aware that according to our analysis, suppliers tend to experience higher levels of cost reductions, quality improvements, and customers' satisfaction. Moreover, when their relationship with the supplier is governed by the fixed price contract, both parties may expect higher levels of customer satisfaction.

17. Limitations and suggestions for future research

Our research has several limitations and suggestions for future research. One of the limitations is its generalizability. Because the respondents were the representatives of Dutch asset owners and maintenance service companies, future research should consider various other international organizations and industries in order to analyse the research question from different perspectives and to allow for better generalizability. Another limitation is the single perspective of the results of this study. For the analysis we used the data gathered from both the buying and the selling companies. However, it might be of the future research interest to differentiate between two perspectives. It is possible that due to the business specificity buyers and sellers differ in norms and values. Hence, it may appear that while the first consider cost reductions and quality improvements as the main performance indicators, the second might be focused on completely different performance outcomes.

Because we didn't find support for some of our hypotheses, the variance in constructs like *Cost reductions* remained unexplained. This leads to our suggestion for future research to reconsider the theoretical framework, since it only implied the effect of relationship governance and contract type. There might be other theoretical constructs, which could potentially better explain the dependent variables and be of interest in determining the buyer-supplier performance outcomes. For instance, future research might cover the importance of organizational culture and learning. Due to Den Hartog & Verburg (2004), organizational culture is the way firms articulate and share norms and values regarding organizational functioning. It is a powerful concept to influence employees' behavior and to improve performance. Additionally, the level of environmental uncertainty or associated risks could be measured. This would provide important information on how do firms make their decisions and how do they behave in different circumstances.

Finally, the measurement instrument has to be reconsidered. It appeared, that among initially formulated variables for constructs of relationship governance and performance outcomes, there were highly intercorrelated variables as well as the variables, which didn't share enough variance with the other variables. This resulted in significant reduction of predicting variables and confusion in determining the theoretical constructs.

References

Artz, K. W., & Norman, P. M. (1998, August). BUYER-SUPPLIER PERFORMANCE: The Role of Asset Specificity, Reciprocal Investments and Relational Exchange. In *Academy of Management Proceedings* (Vol. 1998, No. 1, pp. C1-C18). Academy of Management.

Bergen, M., Dutta, S., & Walker Jr, O. C. (1992). Agency relationships in marketing: a review of the implications and applications of agency and related theories. *The Journal of Marketing*, 1-24.

Blumberg, B., Cooper, D. R., & Schindler, P. S. (2011). *Business research methods*. McGraw-Hill Higher Education.

Carr, A. S., & Pearson, J. N. (1999). Strategically managed buyer–supplier relationships and performance outcomes. *Journal of operations management*,*17*(5), 497-519.

Carson, S. J., Madhok, A., & Wu, T. (2006). Uncertainty, opportunism, and governance: The effects of volatility and ambiguity on formal and relational contracting. Academy of Management Journal, 49(5), 1058-1077.

Celly, K. S., & Frazier, G. L. (1996). Outcome-based and behavior-based coordination efforts in channel relationships. Journal of marketing research, 200-210.

Chen, C.T., Lin, C.T., Huang, S.F., (2006). A fuzzy approach for supplier evaluation and selection in supply chain management. International Journal of Production Economics 102 (2), 289–301.

Den Hartog, D.N. and Verburg, R.M. (2004). 'High performance work systems, organisational culture and firm effectiveness'. Human Resource Management Journal. 14:1, 55-78.

Eisenhardt, K. M. (1985). Control: Organizational and economic approaches. Management science, 31(2), 134-149.

Gunasekaran, A., Patel, C., & Tirtiroglu, E. (2001). Performance measures and metrics in a supply chain environment. International journal of operations & production Management, 21(1/2), 71-87.

Hair, Joseph F., et al. Multivariate Data Analysis: A Global Perspective. 7th ed. Upper Saddle River: Prentice Hall, 2009. Print.

Ho, W., Xu, X., Dey, P.K., (2010). Multi-criteria decision making approaches for supplier evaluation and selection: a literature review. European Journal of Operational Research 202 (1), 16–24.

Hoegl, M., & Wagner, S. M. (2005). Buyer-supplier collaboration in product development projects. *Journal of Management*, *31*(4), 530-548.

Humphreys, P. K., Li, W. L., & Chan, L. Y. (2004). The impact of supplier development on buyer–supplier performance. *Omega*, *32*(2), 131-143.

Irani, Z., Beskese, A., Love, P.E.D. (2004), *"Total quality management and corporate culture: constructs of organizational excellence",Technovation, Vol. 24 pp.643-50.*

Janda, S., & Seshadri, S. (2001). The influence of purchasing strategies on performance. *Journal of Business & Industrial Marketing*, *16*(4), 294-308.

Johnson, W. H., & Medcof, J. W. (2007). Motivating proactive subsidiary innovation: Agent-based theory and socialization models in global R&D. *Journal of International Management*, *13*(4), 472-487.

Kohtamäki, M. (2010). Relationship governance and learning in partnerships. *Learning Organization, The*, *17*(1), 41-57.

Krishnan, R., Martin, X., & Noorderhaven, N. G. (2006). When does trust matter to alliance performance?. *Academy of Management journal*, *49*(5), 894-917.

Kwon, I. W. G., & Suh, T. (2005). Trust, commitment and relationships in supply chain management: a path analysis. Supply chain management: an international journal, 10(1), 26-33.

Müller, R., & Turner, J. R. (2005). The impact of principal-agent relationship and contract type on communication between project owner and manager. International Journal of Project Management, special issue: What is project business, papers from IRNOP 6, 23, 398–403.

Ng, I. C., Ding, D. X., & Yip, N. (2013). Outcome-based contracts as new business model: The role of partnership and value-driven relational assets. *Industrial Marketing Management*, *42*(5), 730-743.

Parsons, A. L. (2002). What determines buyer–seller relationship quality? An investigation from the buyer's perspective. The Journal of Supply Chain Management, 38(2), 4–12.

Paulraj, A., Lado, A. A., & Chen, I. J. (2008). Inter-organizational communication as a relational competency: antecedents and performance outcomes in collaborative buyer–supplier relationships. *Journal of operations management*,*26*(1), 45-64.

Spekman, Robert E. (1988*), "Strategic Supplier Selection: Understanding Long-Term Buyer Relationships," Business Horizons, (July/August), pp. 75-81.*

Turner, J. R. (2004). Farsighted project contract management: incomplete in its entirety. *Construction Management and Economics*, *22*(1), 75-83.
Turner, J. R., & Simister, S. J. (2001). Project contract management and a theory of organization. International Journal of Project Management, 19(8), 457-464.

Van Weele A. J. Purchasing & supply chain management: analysis, strategy, planning and practice. – 2005.

Wang, L., Yeung, J. H. Y., & Zhang, M. (2011). The impact of trust and contract on innovation performance: The moderating role of environmental uncertainty.*International Journal of Production Economics*, *134*(1), 114-122.
Williamson, O. E. (1985). The economic intstitutions of capitalism. Simon and Schuster.

Williamson, O. E. (1996). The mechanisms of governance. Oxford University Press.

Yu, C. M. J., Liao, T. J., & Lin, Z. D. (2006). Formal governance mechanisms, relational governance mechanisms, and transaction-specific investments in supplier–manufacturer relationships. Industrial Marketing Management, 35(2), 128-139.

Appendix A

Measurement items (Likert-scale = 1 to 5)	SL	t
Trust X1_1 - Our relationship with this client is characterized by a high degree of confidence	.799	8.548
X1_2 - Our company and the partner believe that both parties adhere to the contractual agreements	.821	14.421
X1_8 - Our company and the partner do not regard the shortcomings of the counterparty as their own fault	.792	10.930
X1_9 - Our company and the partner work hard to help each other to solve problems that can affect the success of the collaboration	.867	25.417
Communication X2_1 - Our company and the partner communicate frequently with each other	.903	12.063
X2_3 - The contact persons of the counterparty is easy for our company and that of the client	.778	6.242
Commitment X3_1 - Our firm and the partner firm are willing to dedicate whatever people and resources it took to make this relationship a success	.915	7.143
X3_2 - Our firm and the partner firm provide experienced and capable people to the relationship	.870	6.825
X3_3 - Our firm and the partner firm are committed to making this relationship a success	.858	6.325

Appendix B

Varimax with Kaiser Normalization-Rotated Components Analysis Factor Matrix	Factor[a]		
Variables	1	2	Communality
X1_8	.809		.663
X1_9	.780		.728
X1_1	.771		.626
X3_2	.737		.662
X3_1	.729		.682
X1_2	.728		.619
X3_3	.702		.689
X2_1		.832	.723

X2_3		.768	.627
			Total
Sums of Squared Loadings (Eigenvalue):	4.984	1.035	6.019
Percentage of Variance:	55.379	11.497	66.876
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: .905			
Barlett's Test of Sphericity: 425.764			
Significance: .000			

[a]Factor loadings less than .60 have not been printed and variables have been sorted by loadings on each factor

Appendix C

Oblimin with Kaiser Normalization-Rotated Components Analysis Factor Matrix	Factor[a]		
Variables	1	2	Communality
X1_8	.885		.663
X1_1	.804		.626
X1_9	.791		.728
X3_2	.745		.662
X1_2	.742		.619
X3_1	.730		.682
X3_3	.692		.689
X2_1		.820	.723
X2_3		.749	.627
			Total
Sums of Squared Loadings (Eigenvalue):	4.984	1.035	6.019
Percentage of Variance:	55.379	11.497	66.876
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: .905			
Barlett's Test of Sphericity: 425.764			
Significance: .000			

[a]Factor loadings less than .60 have not been printed and variables have been sorted by loadings on each factor

Component Correlation Matrix

Component	Trust_Commitment	Communication
Trust_Commitment	1.000	.393**
Communication	.393**	1.000

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

Appendix D

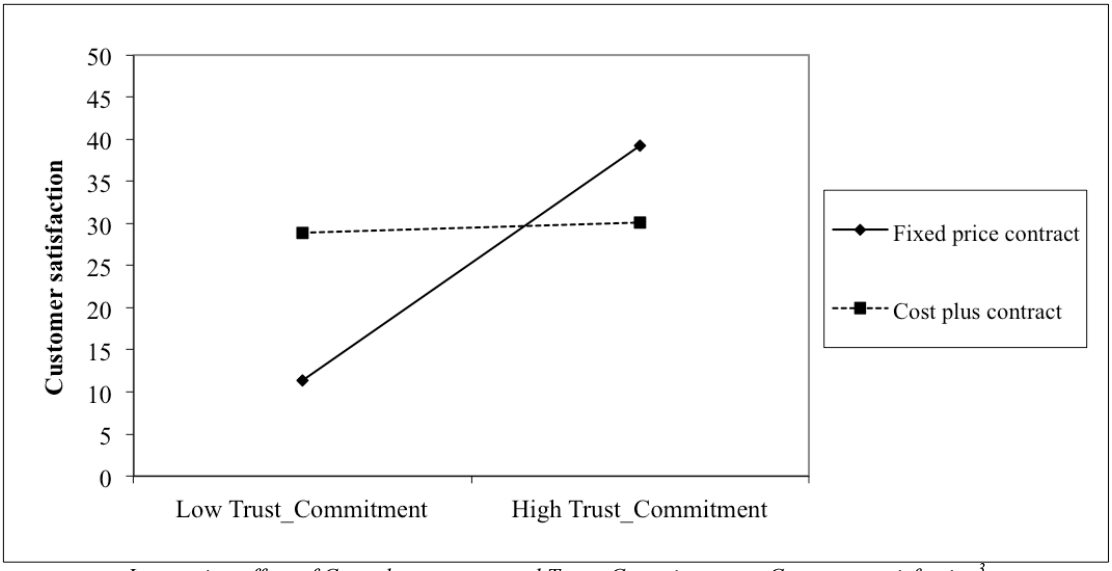
Q1	Are you an asset owner or service provider?	Buyer/Seller
Q2_1	In which maintenance sector do you work (Real estate, infrastructure, fleet (excluding passenger cars), process industry, manufacturing, and food, beverage, & pharmaceuticals)?	Maintenance sector
Q2_2	What type of contract did you use for the inter-organizational relationship (fixed price, cost plus, outcome based)?	
Q3_1	Our relationship with this client is characterized by a high degree of confidence	Trust
Q3_2	Our company and the client trust generally that both parties adhere to the contractual agreements	
Q3_3	Our company and the partner are glad about the information provided by the other	
Q3_4	Our company and the client trust generally that both parties have the right resources (including capital and personnel)	
Q3_5	Our company and that of the client recognize each other's reputation and skills	
Q3_6	Our company and the client do everything necessary to ensure the success of cooperation, even if that means that one must perform tasks that previously agreed	
Q3_7	Neither company holds information which the other party needs to perform well	
Q3_8	Our company and that of the client out of (temporary) counterparty failures not for their own sake	
Q3_9	Our company and those of the principal works hard to help each other to solve problems that can affect the success of the collaboration	
Q4_1	Our company and the partner communicate frequently with each other	Communication
Q4_2	The exchange of information between our company and the partner is frequent informal	
Q4_3	The contact persons of the counterparty is easy for our company	
Q5_1	Our company and the client is willing to use all resources and people needed to make this relationship a success	Commitment
Q5_2	Our company and indicating the client experienced and capable people to this relationship	
Q5_3	Our company and the client have the strong will to make this relationship a success	
Q6_1	We contributed to cost reduction	Performance outcomes
Q6_2	We contributed to quality improvements	
Q6_3	We contributed to higher customer satisfaction	

Appendix E

Correlation between theoretical constructs

	Factors	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Trust_Commitment (TC)	3.99	.676	1												
2	Communication (CM)	4.24	.710	.000	1											
3	Customer satisfaction (CS)	5.23	1.42	.318**	.201	1										
4	Reduced costs (RC)	4.69	1.67	.243*	.144	.722**	1									
5	Quality improvement (QI)	5.20	1.45	.285**	.203*	.850**	.788**	1								
6	Fixed price contract (FP)	-	-	.008	.000	.196	.050	.156	1							
7	Cost plus contract (CP)	-	-	.032	-.028	.005	-.063	-.120	-.329*	1						
8	Industry: Infrastructure	-	-	-.276**	.180	-.123	-.171	-.104	.207*	-.120	1					
9	Industry: Fleet	-	-	.039	.060	.138	.145	.145	-.046	-.151	-.089	1				
10	Industry: Process	-	-	-.015	.069	.193	.215*	.176	.040	-.030	-.280*	-.212*	1			
11	Industry: Manufacturing	-	-	.133	-.019	-.008	.051	.025	-.065	.114	-.097	-.073	-.230*	1		
12	Industry: Food, Beverage, Pharma.	-	-	.071	-.292**	-.182	-.183	-.227*	-.096	.305**	-.143	-.108	-.339**	-.177	1	
13	Supplier (vs Buyer)	-	-	.095	-.035	.562**	.565**	.554**	.068	-.006	-.004	.170	.077	-.043	-.123	1
	Cronbach's Alpha	-	-	.906	.604	-	-	-	-	-	-	-	-	-	-	-
	Composite Reliability	-	-	.925	.830	-	-	-	-	-	-	-	-	-	-	-
	Average Variance Extracted (AVE)	-	-	.638	.710	-	-	-	-	-	-	-	-	-	-	-
	N=95 Note: **Significance level: p≤0.01 (2 tailed); *Significance level: p≤0.05 (2-tailed)															

Appendix F



Interaction effect of Cost plus contract and Trust_Commitment on Customer satisfaction[3]

Appendix G

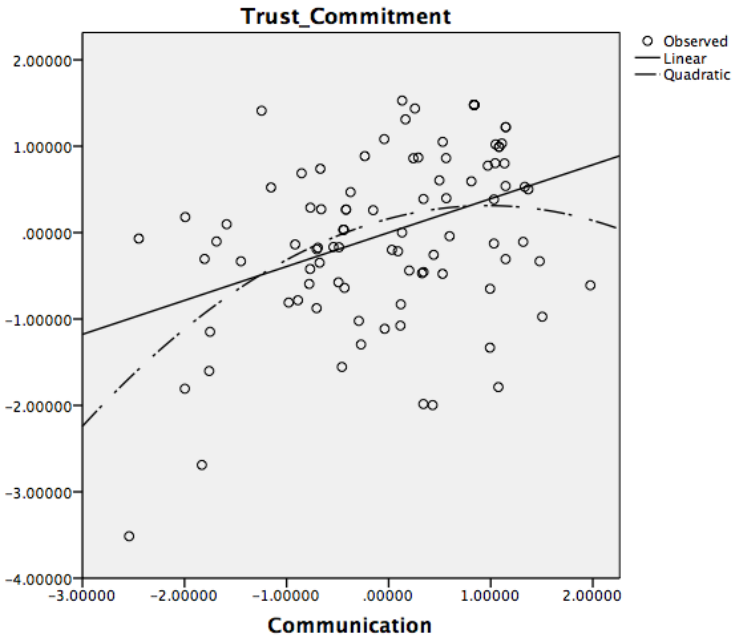
∩-Shaped effect of Communication on Trust_Commitment and Performance outcomes

Predictor	**Dependent variable**			
	Trust_Commitment	Cost reduction	Quality improvement	Customer satisfaction
Communication (Linear effect)	.314**	. 114	.237*	.258*
Communication (Curvilinear effect)	-.202*	-.156	-.006	.042
Variance explained (R^2) – linear effect	.154(000)	.031(.090)	.057(.019)	.058(.018)
Variance explained (R^2) – curvilinear effect	.189(.000)	.051(.089)	.057(.066)	.060(.059)
Tolerance	.850			
VIF	1.177			

Note: **Beta-Values significant at p≤0.01; *Beta-Values significant at p≤0.05

[3] Note: The range of the scale for Customer satisfaction is 0-50. This is due to the transformation of the dependent variables, which was made in order to meet the normality assumption.

Appendix H



∩-Shaped effect of Communication on Trust_Commitment

Appendix I

Moderation effect of Communication on effect of Trust_Commitment on Performance outcomes

Predictor	**Dependent variable**			**Tolerance**	**VIF**
	Cost reduction	Quality improvement	Customer satisfaction		
Trust_Commitment	.240*	.274*	.311**	.828	1.207
Communication	.078	.124	.114	.796	1.256
Interaction (Trust_Commitment X Communication)	-.009	-.027	-.018	.883	1.133
Variance explained (R^2)	.080(.054)	.123(.007)	.142(.003)		

Note: **Beta-Values significant at p≤0.01; *Beta-Values significant at p≤0.05

Appendix J

Mediation effect of Trust_Commitment in effect of Communication on Customer satisfaction

Mediator Trust_Commitment	**Dependent variable**	**LLCI**	**ULCI**	**BootLLCI**	**BootULCI**
	Customer satisfaction				
Direct effect	1.5562(.2635)	-1.1910	4.3033		
Indirect effect	1.6215			.4538	3.4411
Total effect	3.1777(.0185)	.5460	5.8094		
Standardized indirect effect of X on Y	.1231			.0324	.2505

Mediation effect of Trust_Commitment in effect of Communication on Quality improvement

Mediator Trust_Commitment	**Dependent variable**	**LLCI**	**ULCI**	**BootLLCI**	**BootULCI**
	Customer satisfaction				
Direct effect	1.5562(.2635)	-1.1910	4.3033		
Indirect effect	1.6215			.4538	3.4411
Total effect	3.1777(.0185)	.5460	5.8094		
Standardized indirect effect of X on Y	.1231			.0324	.2505

Mediation effect of Trust_Commitment in effect of Communication on Cost reduction

Mediator Trust_Commitment	**Dependent variable**	**LLCI**	**ULCI**	**BootLLCI**	**BootULCI**
	Cost reduction				
Direct effect	1.1768(.4641)	-2.0020	4.3555		
Indirect effect	1.3958			.2363	3.2858
Total effect	2.5725(.0903)	-.4119	5.5570		
Standardized indirect effect of X on Y	.0948			.0168	.2229