

**Effects of Inter-Organizational Trust and Environmental Uncertainty on  
Governance Mechanism of Coopetition: the Moderating Role of Asset  
Specificity**

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*Abstract: Despite the increased concern about coopetition, the field still lacks a theoretical framework to describe the influencing factors of governance mechanism. Based on transaction cost theory and social exchange theory, this paper examine the impact of environmental uncertainty and inter-organizational trust on governance mechanisms of coopetition. Empirical results from a survey of 115 Chinese firms indicate that: (1) there is a positive relationship between environmental uncertainty and relationship governance; (2) there is an inverted U-shaped relationship between competence trust and formal governance; (3) there is a positive relationship between asset specificity and formal governance, moreover asset specificity negatively moderates the inverted U-shaped relationship between competence trust and formal governance; (4) the link coopetition prefer to apply formal governance and relational governance mechanism than scale coopetition, this study contributes and extends knowledge of the choice governance mechanism in competitive relationship*

*Keywords: coopetition, governance mechanisms, asset specificity*

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## **1. INTRODUCTION**

In recent years, more and more companies cooperate with their competitors, so as to improve performance and innovation ability (ritual & Hurmelinna-Laukkanen, 2009; ritual, 2012). For example, a joint venture was set up by Samsung Electronics and Sony corporation in September 2003 to produce the 7th generation LCD, they also set another joint venture in August 2007 to produce the 8th plant. This coopetition among giants create benefits for partnering firms and advance technological innovation in the industry (Gnyawali & Park, 2011). However, companies involved in coopetition can get better performance, but also will face low success rate and high risk (Das & Tang, 2001), because the increasing in coordination costs and agency costs, technology barriers, cultural in adaptation, excessive reliance on

resources of the other party, etc. (Zine din, 2004). Compared to the general strategic alliance (such as cooperation with suppliers or customers), enterprises need to be more cautious on work with competitors, so how to choose the appropriate governance mechanisms is critical to control the competitive relationship.

This article aims to develop a theoretical framework of governance mechanism in coopetition. We first address the literature review and then two tracks are promoted in developing this framework. One track is to find the relationship between environmental uncertainty, inter-organizational trust, asset specificity, and coopetition type and governance mechanisms, so as to propose corresponding hypotheses. And then we introduce the survey to collect data from enterprises, give a description of the methodology and discuss results of the empirical analysis. Finally, we draft a set of propositions for future research.

## **2. THEORETICAL REVIEWS AND RESEARCH HYPOTHESES**

### **2.1 Governance mechanisms of coopetition**

Coopetition are considered to be a win-win strategy in most researches. Cooperating with competitors is good idea because it can bring better performance. A variety of legal control mechanisms and social coordination mechanisms can be used to protect cooperation resources and allocate joint income obligations in competitive relationship, which can be classified as formal governance and relational governance.

Formal governance represents promises, obligations and processes for dispute resolution in formal contracts, which are signed between enterprises and their competitors. Formal governance can strengthen supervision, reduce opportunistic behaviors, and prevent competitors to seize special quasi-rents by limiting illegal and inappropriate behavior (Williamson, 1985). In addition, formal governance can also coordinate official cooperation inputs. Formal governance stems from the control concept in cooperation, which regards transaction cost economics as the theoretical basis, and pays more attention to control partners' opportunistic behaviors.

Relational governance represents the social processes that promote norms of flexibility, solidarity and information exchange by trust and social identification (Dyer & Singh, 1998). Relational governance can take many diverse forms, such as team building, working groups, committees, official exchange, sharing decision, etc. Relational governance can strengthen communications with partners, coordinate daily activities, get mutual learning, so as to form a common language to establish a trust relationship between enterprises, and reduce the threat of conflict and risks through interaction between enterprises and their partners (Kale et al., 2000).

### **2.2 Environmental uncertainty**

Environmental uncertainty refers to the volatility and ambiguity of change in the environment over times, which create uncertainty about future conditions, such as the instability and un-prediction of the market, changes in technology and customer preferences, fluctuation of product demand or raw materials supply (Dress & Beard, 1984). Environmental uncertainty has the following three characteristics: (1) dynamic, which refers to the updated degree of

composed parts or elements in environment and whether there are causal relationships among various elements; (2) complexity, which refers to differentiation within environment and whether the distribution of environmental elements is concentrated; (3) fuzzy, which refers to uncertainty degree of the inherent recognition of the environmental state (Carson et al., 2006).

Due to environmental uncertainty, enterprises face the following challenges in cooperation: the increase of opportunism and the bottleneck in information processing. Williamson (1985) pointed out that when selfish partners participate in negotiations the antagonistic and non-cooperative bargaining is inherent. More specifically, because of the obscure perception of partners' behaviors, opportunistic behaviors, such as evasion and deception, were found with a low probability to be punished (Ouchi, 1980). In other words, environmental uncertainty makes the opportunistic behavior more profitable, thus increase its probability of occurring. From another perspective, environmental uncertainty let decision makers need to provide a quick response, which requires companies to effectively observe the environment, search accurate and reliable information, so as to perceive threats and opportunities, and then take action (Hambrick, 1982; Huber et al., 1990). It certainly will bring about information overload, which has an effect on the speed of information processing and the adjustment of cooperation strategy. Thus, the important thing is not the environmental uncertainty, but uncertainty to precise information processing in the process of strategic adjustment (Anderson & Paine, 1975).

Either the opportunistic behavior or the bottleneck of information processing requires adapting to the uncertain environment in the competitive relationship. When uncertainty increases, the need to adapt to change becomes more important (Williamson, 1985). Enterprises can choose the formal governance or relational governance to cope with uncertainty. From the perspective of new classical contract theory, the optimal response to uncertainty is a more extensive contract. In practice, enterprises design extremely complicated contracts to cope with environmental uncertainty, by which the partner may seek contract terms to reduce uncertainty (especially fuzzy) too. On the other side, some enterprises take sociological approach and focus on the relational governance. According to relational contract theory, many kinds of social forces will have strong obstacles to the opportunistic behavior, thus cooperative behaviors become self-reinforcing results (Krishnan et al., 2006). Then, the method to deal with environmental uncertainty also includes the relational governance. Hence, enterprises faced with environmental uncertainty will positively influence governance mechanisms. H1a. There is a positive relationship between environmental uncertainty and formal governance in competitive relationship; H1b. There is a positive relationship between environmental uncertainty and relational governance in competitive relationship.

### **2.3 Inter-organizational trust**

Inter-organizational trust refers to the positive expectations of a vulnerable focal firm on the predictability of partners' behavior, which mitigates future concerns about opportunism (Barney & Hansen, 1994; Gulati & Nickerson, 2008). In general, inter-organizational trust

includes two dimensions: goodwill trust and competence trust (Notebook, 1996). Goodwill trust is an expectation that the other party will have moral obligation and responsibility to pay attention to the interests of the other party except their own interests. Competence trust refers to the trusted party has positive confidence on the competency to undertake trustee's obligations (Barber, 1983; Cook & Wall, 1980). Connelly (2012) indicated out that trust is influenced by the context: there is uncertainty when the trust in a situation moved to another situation, namely context-specific inter-organizational trust. Thus, inter-organizational trust can be divided into two dimensions: in-context trust and out-of-context trust.

In the process of coopetition, trust may have two kinds of effects: inter-organizational trust reduces opportunism behaviors and lead to strategic blindness. Trust is positive expectations that a partner will not take opportunistic behaviors, thus social processes and interactive mode are foundations of trust with the periodical interaction (Gulati & Synchron, 2008). Therefore, in the process of cooperation, enterprises derive from partner with the tendency of opportunism behavior cooperating with those trustworthy partners. Because of inevitable bias of trust, enterprises prefer to make habit to depend on each other and has tendency to excessive reliance on their partners, resulting in paying little attention to the integrity and accuracy of information when it inspect threats and opportunities of cooperation. Hence, inter-organizational trust may lead to sub optimal effect, which is "the strategy blindness", so as to completely insensitive to environmental changes (Cecily et al., 2003).

However, trust is the basis of various governance mechanisms, especially relational governance, because as with the enforcement and egoism, trust is an important source of cooperation (Notebook et al., 1997). Inter-organizational trust is an important supplement to the governance framework proposed by Williamson (1985), because Williamson's governance only focuses on mandatory contract (legal order) and the motivation to self-interest (private arrangement). The positive effect of trust on relational governance has been demonstrated (Gulati & Nickerson, 2008). However, the relationship between inter-organizational trust and formal governance is ambiguous. On the one hand, partners' expectation on positive will or behavior represented by the trust will improve the management effectiveness, because trust can replace (at least partly) formal contract, so trust can reduce the dependent on particular contractual agreement (Purina & Vainest, 2009). On the other hand, inter-organization trust and governance mechanisms complement with each other, because contract specificity increases with partners' trust (Luo, 2002; Poppa & Zenger, 2002). Due to the complex and multiple background interaction with competitors in the cooperative relationship (Mesquite, 2007), the trust will promote the use of various governance mechanisms, which is an important source of effectiveness in coopetition. But because trust can also produce negative effects such as strategy blindness, there is not a simple linear relationship between trust and formal governance mechanisms. Therefore, the following hypothesis is proposed: H3. There is an inversely U-type relationship between competence trust and formal governance in competitive relationship; H4. There is an inversely U-type relationship between goodwill trust and the relational governance in competitive relationship.

## **2.4 Asset specificity**

As a special form of cooperation between enterprises, there are needs two parties to invest in different specific assets, such as personnel, facilities, capital and technology in cooperation. So asset specificity is the key factor to the governance mechanisms of cooperation. Asset specificity refers to the degree of specialization of the various assets invested enterprise and its partners in the process of competition and cooperation. According to the transaction cost theory, when the asset specificity is high and enterprises need to use more complex governance mechanisms, so as to reduce opportunism behaviors. Therefore, asset specificity will lead to the use of formal governance mechanism in cooperation. Asset specificity is also an important factor to relational governance. Poppa et al. (2008) indicated that the relationship between asset specificity and relational governance was positively related. Vandal et al. (2007) also indicated that seller's and buyer's asset specificity is able to improve relational governance. Hence, the asset specificity has a positive effect on the formal governance and relational governance. Based on this, the following hypothesis is proposed: H5a. There is a positive relationship between asset specificity and formal governance in cooperation; H5b. There is a positive relationship between asset specificity and relational governance in cooperation.

When enterprises with high inter-organizational trust to partners confront with high asset specificity, asset specificity will reduce the positive effect of inter-organizational trust on formal governance mechanism. Although enterprises have more confidence to partners, inter-organizational trust is just a state of mind based on previous experience or perception, rigorous governance mechanisms are efficient way of control when they face risk. Therefore, the following hypothesis is proposed: Hypothesis 6a: asset specificity negatively moderates the inversely U-type relationship between competence trust and formal governance; Hypothesis 6b: asset specificity negatively moderates the inversely U-type relationship between goodwill trust and the relational governance.

## **2.5 Coopetition types**

Coopetition is also known as rivals' alliances by some scholars, which can be divided into link alliance and scale alliance (Dusssauge et al., 2000). The link alliance refers that partners contribute different ability to the alliance, while the scale alliance refers that the enterprises has similar ability contributed to the partnership, so as to expand the alliance scale. In fact, the nature of the link alliance is the complementary alliance. According to the logic, the coopetition of the enterprise can be divided into two types: the link coopetition and the scale coopetition. The link coopetition is the ability of the two parties is different and complement with each other, while the scale coopetition refers to the coopetition with the same ability of the two parties. Because of the link coopetition is related to many problems and more complex, such as coordination and adaptability to different ability, cultural differences, and other management difficulty, so enterprises need more complex governance mechanism. Based on this, the following hypothesis is proposed: H7a. There is a positive relationship between the link coopetition and formal governance; H7b. there is a positive relationship between the scale coopetition and relational governance.

### **3. RESEARCH METHODOLOGY**

#### **3.1 Variables and measures**

Multi-item measures were developed based on existing scales identified in the literature and made some minor modifications to suit our research purpose and context. All multi-item measures were based on 5-point Likert scales from 1 (strongly disagree) to 5 (strongly agree), which appear in the table 1.

##### **3.1.1 Dependent variables**

Formal governance was measured by two dimensions: terms specificity and contingency adaptability. Adapted from Luo (2002), terms specificity can be measured using a five-item Likert scale reflecting the extent to whether provisions concerning how to implement cooperation and how to manage the cooperation matters; contingency adaptability can be measured by three items reflecting the extent to the terms of the contract is subjected to uncertain environment or resource availability infringement matters. Adapted from Sarkar et al. (2009), relational governance can be measured by 5 items ,such as “when cooperation diverge, we usually need to evaluate facts trying to reach a mutually satisfactory results”, “except to fulfill specific agreement, enterprises and partners often exchange the information in private”,etc.

##### **3.1.2 Independent variables**

Adapted from coven & Sliven (1989) and Tang (2006), environmental uncertainty was captured by 4 items, such as “it is easy to predict market demand and consumer preference in the industry”, “it is easy to predict other company’s market behavior in the industry”, etc. Inter-organizational trust includes two dimensions: competence trust and goodwill trust. Adapted by Das & Tang (2001) and Liu et al. (2006), competence trust can be measured by four items, such as “our partners is entirely possible qualified to work in cooperation”, “our partner has good reputation”. Goodwill trust can be also measured by four items reflecting the extent that “when we encountered difficulties in cooperation or new situations, our partners will continue to abide by its commitments”, “we are familiar with each other’s behavior mode and can rely on these pattern action”,etc. Adapted from Schreiner (2009), asset specificity includes 3 dimensions by using three items, such as investment specificity, human capital specificity and dedicated specificity. Adapted from Dussauge (2000), coopetition type is a dummy variable, and “1” represents link coopetition, and “0” represents the scale coopetition.

##### **3.1.3 Control variables**

Following to prior research, 4 variables can be operationalized as control variables, such as cooperation duration, cooperation experience, cooperation scale and firm size. The cooperation duration refers to the duration time of cooperation between enterprises and their competitors; cooperation experience refers to whether the enterprise is cooperated with other enterprises, which is a dummy variable; cooperation scale refers to the proportion of total assets involving in cooperation accounted for total assets of the enterprise; enterprise scale can be divided into large, medium and small enterprises according to the classification standard of the Chinese National Bureau of statistics.

### 3.2 Data and Sample

Data were collected by a survey of cooperation in China. As stated above, we identified cooperation as cooperating with competitors. In the last decades, China has become one of the most promising development regions in the world. Cooperation has been a prevalent mode to expand market and develop technology. Thus, China provided a rich and suitable context in which to study the governance mechanisms. To obtain a target population of cooperation, we identified a sample of 115 cooperation operating in China (as shown in Table 1). The survey conducted about 2 months during June to August in 2013. We sent out 500 questionnaires and acquire 115 effective questionnaires. The effective return ratio is 23%.

Table1 the profile of respondent firms

Firm size	Frequency(115)	Frequency ratio (%)	Industry	Frequency(115)	Frequency ratio (%)
Large enterprises	32	27.8	Manufacturing industry	25	21.7
Medium-sized enterprise	45	39.1	Real estate industry	8	7.0
Small business	38	33.0	Construction industry	6	5.2
Firm nature			Financial industry	18	15.7
State-owned enterprises	50	43.5	Wholesale and retail industry	9	7.8
Limited company	35	30.5	Transportation industry	10	8.7
Private enterprises	16	13.9	Electric power industry	15	13.0
Foreign invested enterprises	10	8.7	Information technology	10	8.7
Others	4	3.5	Others	14	12.2

## 4. ESTIMATION AND RESULTS

### 4.1 Reliability and Validity

The reliability of the scale can be tested by the coefficient of Cronbach  $\alpha$ , and results were shown in Table 2. From table 2, majority variables' Alpha coefficients have reached the standard requirements of 0.7. The Alpha coefficient of contingency adaptability is close to 0.7, the Alpha coefficient of goodwill trust is bigger than 0.6. Overall, the reliability index meets the research requirement.

The measurement of each variable comes from the relatively mature research scale, which has good content validity through a strict bilingual translation method. Each variable from the sample should be conducted by AMOS 7 software so as to verify the construct validity, which can be assessed by running a confirmatory factor analysis (CFA) with structural equation modelling. It also indicates convergent validity among items of each scale. As shown in table 3,

the measurement model fits the data satisfactorily. Each variable's value of RMR, CFI, GFI, RMSEA and  $\chi^2/df$  are all up to the standard value. Because asset specificity has only 3 items, the CFA model is not set up, but analysis of its KMO value is 0.722 by the exploratory factor analysis, which also passes through the Bartlett's spherical degree test.

Table 2 the reliability test of variables

Variable	Dimensions	Items' number	Alpha coefficient
Formal Governance(F)	Terms specificity (F1)	4	0.837
	Contingency adaptability (F2)	3	0.696
Inter-organizational Trust (T)	Competence trust(T1)	4	0.744
	Goodwill trust(T2)	3	0.610
Relational governance (G)		5	0.826
Environmental uncertainty(U)		4	0.690
Asset specificity (A)		3	0.838

Table 3 Results of CFA

Test index		$\chi^2/df$	GFI	CFI	RMSEA	RMR
Standard value		< 5	> 0.9	> 0.9	< 0.1	< 0.5
F	F1	1.101	0.970	0.996	0.030	0.029
	F2					
T	T1	1.033	0.970	0.998	0.017	0.025
	T2					
G		1.901	0.987	0.991	0.089	0.014
U		1.376	0.989	0.993	0.057	0.054

The discriminant validity can be calculated by AVE value. The square root of AVE values for formal governance and relational governance were 0.877 and 0.806 respectively, which are higher than correlation coefficients between any two dimensions. Independent variables, such as environmental uncertainty, competence trust and goodwill trust, asset specificity have the square root of AVE values as 0.732, 0.764, 0.618, and 0.839 specifically, which are significantly higher than their correlation coefficient between any two dimensions.

#### 4.2 Descriptive statistics and Correlations

Descriptive statistics and zero-order correlations from variables appear in table 4. Inter-organizational trust is positively correlated to governance mechanisms ( $0.219 < R < 0.641$ ;  $p < 0.01$ ), which refers that inter-organizational trust is the key factor influencing governance mechanisms. Asset specificity is positively correlated to formal governance ( $0.192 < R < 0.264$ ;  $p < 0.01$ ), which shows that asset specificity is a key factor affecting formal governance, but asset specificity and relational governance are not significantly related; the degree of correlation among environmental uncertainty, competition type and governance mechanism are weak.

Table 4 Descriptive statistics and zero-order correlations

Variable	1	2	3	4	5	6	7
1. Formal governance	1						
2. Relational governance	0.642**	1					
3. Environmental uncertainty	0.102	0.175	1				
4. Competence trust	0.599**	0.579**	0.063	1			
5. Goodwill trust	0.547**	0.515**	0.219*	0.663**	1		
6. Asset specificity	0.264**	0.159	-0.124	0.204*	0.046	1	
7. Cooperation type	0.073	0.056	-0.240**	-0.165	-0.133	-0.009	1
Mean	3.642	3.843	3.3	3.685	3.568	3.075	0.67
Standard deviation	0.65	0.684	0.819	0.617	0.569	0.928	0.472

\* $\alpha=0.05$  \*\* $\alpha=0.01$  Two-tailed

### 4.3 Hierarchical regression analysis

In order to avoid multi-collinearity problems, this article carries on the central processing to all the variables before hierarchical regression analysis, and then uses the multilevel regression analysis method to verify all the hypotheses. Regression analysis results are shown in table 5. Since formal and relational governance mechanisms are chosen simultaneously, multiple moderated regressions are applied to test the proposed model. Prior to the creation of the interaction terms in model 3, we mean centered the independent variables to reduce multi-collinearity. Variance inflation factors (VIF) also be calculated for every regression equation. The maximum VIF within the models was 5.090, which is well below 10.

Table 5 Effect of environmental uncertainty and inter-organizational trust on governance mechanisms: moderated regression analysis

Variables		Hypotheses	Formal governance			Relational governance		
			Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Independent variables	Environmental uncertainty (X <sub>1</sub> )	H1a;H1b	0.103	0.128*	0.130*	0.166*	0.180*	0.184*
	Competence trust (X <sub>2</sub> )		0.370**	0.226†	0.243*	0.509***	0.467**	0.480**
	Goodwill trust(X <sub>3</sub> )		0.326**	0.396**	0.491***	0.262*	0.292*	0.382**
	Asset specificity(X <sub>4</sub> )	H5a;H5b	0.127*	0.174**	0.248***	0.069	0.096	0.161*
	Cooperation type(X <sub>5</sub> )	H7a;H7b	0.306**	0.301**	0.281**	0.385**	0.374**	0.357*
	X <sub>2</sub> <sup>2</sup>	H3a		-0.283**	-0.299**		-0.111	-0.130
	X <sub>3</sub> <sup>2</sup>	H4a		0.299**	0.333**		0.263**	0.299*
	X <sub>4</sub> * X <sub>2</sub> <sup>2</sup>	H6a			-0.299†			-0.290
X <sub>4</sub> * X <sub>3</sub> <sup>2</sup>				0.078			0.088	
Control variables	Cooperation duration		-0.015	-0.010	-0.009	-0.020	-0.016	-0.015
	Cooperation experience		-0.285**	-0.293**	-0.300**	-0.057	-0.059	-0.064
	Cooperation size		0.019	0.030	0.027	-0.009	0.002	-0.001
	Firm size		-0.102	-0.098	-0.114†	0.008	0.004	-0.012
Adjusted R <sup>2</sup>			0.46	0.506	0.518	0.429	0.453	0.458
ΔAdjusted R <sup>2</sup>				0.046	0.012		0.024	0.005
F values			10.483	10.324	9.261	9.348	8.522	7.488
Max VIF			2.056	2.729	5.090	2.056	2.729	5.090

P-values in parentheses: † p<0.1, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

(a) Influencing factors of formal governance

The baseline model is model 1, in which we adds independent variables based on control variables. Results show that asset specificity is a significant predictor of formal governance ( $\beta=0.127$ ;  $P < 0.05$ ), so the hypothesis 5a has been justified. The link coepetition has positively related with the formal governance ( $\beta= 0.306$ ;  $P < 0.01$ ), so that hypothesis 7a has been identified. As a control variable, cooperation experience is also a significant predictor of formal governance ( $\beta= -0.285$ ;  $P < 0.01$ ).

The model 2 illustrates the quadratic effects of inter-organizational trust on governance mechanisms. The competence trust squared parameter is negative and significant ( $\beta= -0.283$   $P < 0.01$ ), indicating that competence trust has an inverted U-shaped relationship with formal governance. Thus, the hypothesis 3a is supported. While the goodwill trust squared parameter is positively related to formal governance, so hypothesis H4a has not been supported, which also indicate that goodwill trust plays a positive role in promoting formal governance but does not have an inverted U-shaped effect. When adding the quadratic term of inter-organizational trust, environmental uncertainty becomes a significant predictor of formal governance ( $\beta= 0.128$ ,  $P < 0.05$ ), which supports hypothesis 1a partly.

Model 3 shows the interaction effects between inter-organizational trust squared parameter and asset specificity. Results are shown that the interaction between competence trust squared parameter and asset specificity is negatively associated with formal governance ( $\beta= -0.299$ ,  $P < 0.1$ ), which supports hypothesis 6a, which indicates that asset specificity can regulate the inverted U-shaped relationship between competence trust and formal governance.

#### (b) Influencing factors of relational governance

Model 4 is also taking as the baseline model, which adds independent variables based on control variable. As predicted by hypothesis 1b, environmental uncertainty is significantly predictor of relational governance ( $\beta= 0.166$ ;  $P < 0.05$ ). Competing types is significantly associated with relational governance ( $\beta= 0.385$ ;  $P < 0.01$ ), which supports hypothesis 7b, indicating that link coepetition also tend to choose relational governance. While we do not find support for hypothesis 5b that asset specificity enhance the use of relational governance.

## 5. DISCUSSION AND CONCLUSION

We find evidence that the optimal choice of governance mechanisms in coepetition depends on environmental uncertainty, inter-organizational trust and asset specificity. In the competition and cooperation process, how to choice appropriate corporate governance according to the different environment, relations and attributes factors is the key problem. This paper aims to reveal the influences of environmental uncertainty, organizational trust, asset specificity and coepetition types on the governance mechanism on the basis of the theory of transaction cost and social transaction. This article has the following findings.

Firstly, the relationship between environmental uncertainty and governance mechanisms are proposed and tested. In competitive relationship, environmental uncertainty has a positive effect on the relational governance, but it has no significant effect on the formal governance,

which indicates that enterprises should choose the relational governance mechanism when they face high environmental uncertainty.

Secondly, the relationship between the two kinds of inter-organizational trust and governance mechanisms is proposed and identified. Results show that the relationship between the competence trust and formal governance is not a simple linear relationship, but a significant inverted U type relationship, which means that the dependence and use of formal governance will appear with a trend of increase first and then decrease with the strengthened competence trust.

Thirdly, it is proposed and tested the effect of asset specificity and cooperation type on governance mechanisms. Asset specificity has a significant positive effect on formal governance, but has no significant effect on the relational governance, which means that enterprises with specific investment need to pay more attention to limit partners for potential opportunistic behaviors through formal governance; asset specificity can regulate negatively the inverted U-shaped relationship between the competence trust and formal governance, which means that the effect of competence trust on formal governance be weakened by asset specificity; meanwhile cooperation type is significant and positive predictor of governance mechanisms, which indicates compared with the scale type, link cooperation is more dependent on the effective use of various governance mechanisms than the scale cooperation.

It is important to choose the appropriate governance mechanism with the influencing factors enterprises faced with. For enterprises involving in competitive relationship, relational governance is a better choice when the environmental uncertainty is high. Competence trust can promote the choice of formal governance, but the asset specificity will reduce this impact. Because complex formal governance can play a role in cooperation, but its operating costs are high, and the appropriate competence trust can have a substitution effect in the process, so as to reduce the governance cost. However, the role of the competence trust will be weakened when the dedicated investment is large. Moreover, formal governance and relational governance should be pronged and play a synergistic role in the link cooperation. Overall, enterprises should choose the matching governance mechanism based on the different influencing factors, so as to achieve the cooperation goal effectively.

This research has several limitations that also suggest directions for future research. First, governance mechanisms are also influenced by other factors in addition to environmental uncertainty, inter-organizational trust, asset specificity and cooperation types, such as asset matching, mutual dependence, etc. Therefore, a further comprehensive analysis of influencing factors of governance mechanism is needed. Second, governance mechanism of enterprise cooperation is a dynamic process; the relationship between different factors is constantly changing. Therefore, a dynamic longitudinal study can be more accurately to reveal the relationship among them.

## **REFERENCES**

- [1] Anderson, C. R., & Paine, F. T. (1975). Managerial Perceptions and Strategic Behavior [J].

- Academy of Management Journal, Vol. 18, p. 811–823.
- [2] Barber, B. (1983) *the Logic and Limits of Trust*. Rutgers University Press: New Brunswick, NJ.
- [3] Barney, J.B., & Hansen, M.H. (1994). Trustworthiness as a Source of Competitive Advantage. *Strategic Management Journal*, Vol. 15(S1), p. 175-190.
- [4] Carson, S.J., Macho, A., & Wu, T. (2006). Uncertainty, Opportunism, and Governance: The Effects of Volatility and Ambiguity on Formal and Relational Contracting, Vol. 49 (5), p. 1058-1077.
- [5] Connelly, B.L., Miller, T., & Devers, C.E. (2012). Under a Cloud of Suspicion: Trust, Distrust, and their Interactive Effect in Interorganizational Contracting. *Strategic Management Journal*, Vol. 33(7), p. 820–833.
- [6] Cook, J., & Wall, T. (1980). New Work Attitude Measures of Trust, Organizational Commitment, and Personal Need Fulfillment. *Journal of Occupational Psychology*, Vol. 53, p. 39–52.
- [7] Covin, J.G., & Levin, D.P. (1989). Strategic Management of Small Firms in Hostile and Benign Environments. *Strategic Management Journal*, Vol. 10(1), p. 75-87.
- [8] Das, T. K. & Tang, B.S. (2001). Trust, Control, and Risk in Strategic Alliances: An Integrated Framework. *Organization Studies*, Vol. 22(2), p. 251-283.
- [9] Dress, G. G., & Beard, D. W. (1984). Dimensions of Organizational Task Environments. *Administrative Science Quarterly*, Vol. 29, p. 52–73.
- [10] Dosage, P., Garrett, B. & Mitchell, W. (2000). Learning from Competing Partners: Outcomes and Durations of Scale and Link Alliances in Europe, North America and Asia. *Strategic Management Journal*, Vol. 21, p. 99–126.
- [11] Dyer, J. H. & Singh, H. (1998). The Relational View: Cooperative Strategy and Source of Interorganizational Competitive Advantage. *Academy of Management Review*, Vol. 23(4), p. 660 -679.
- [12] Gulati, R., & Nickerson, J. (2008). Interorganizational Trust, Governance Choice, and Exchange Performance. *Organization Science*, Vol. 19(5), p. 688–708.
- [13] Gulati, R., & Snych, M. (2008). Does Familiarity Breed Trust? Revisiting the Antecedents of Trust. *Managerial Decision Economic*, Vol. 29, p. 169–190.
- [14] Gnyawali, D.R. & Park, B. R. (2011). Co-opetition between Giants: Collaboration with Competitors for Technological Innovation. *Research Policy*, Vol. 40(5), p. 650-663.
- [15] Hambrick, D. C. (1982). Environmental Scanning and Organizational Strategy [J]. *Strategic Management Journal*, Vol. 3, p. 159–174.
- [16] Huber, J. P., Miller, C. C., & Glick, W. H. (1990). Developing More Encompassing Theories about Organizations: The Centralization-Effectiveness Relationship as an Example. *Organization Science*, Vol. 1, p. 11–40.
- [17] Kale, P., Singh, H., & Perlmutter, H. (2000). Learning and Protection of Proprietary Assets in Strategic Alliances: Building Relational Capital. *Strategic Management Journal*, Vol. 21(3), p. 217-237.

- [18] Krishnan, R., Martin, X., & Noorderhaven, N. G. (2006). When Does Trust Matter to Alliance Performance? *Academy of Management Journal*, Vol. 49(5), p. 894-917.
- [19] Liu Xu, Xiang Xiao Feng, Lin Gang, Li Mingling. (2006) .Initial Trust and Control Strategy in the R&D Alliance: a Research on the Chinese Pharmaceutical Industry. *Management World*, Vol. 11, p. 90-143.
- [20] Luo, Y. (2002). Contract, Cooperation, and Performance in International Joint Ventures. *Strategic Management Journal*, Vol. 23, p. 903–919.
- [21] Cecily, B., Perrine, V., & Sheer, A. (2003). Trust as an Organizing Principle. *Organization Science*, Vol. 14, p. 91–103.
- [22] Mesquite, L.F. (2007). Starting Over When the Bickering Never Ends: Rebuilding Aggregate Trust among Clustered Firms through Trust Facilitators. *Academy of Management Review*, Vol. 32, p. 72–91.
- [23] Notebook, B., Berger, H. & Noorderhaven, N.J. (1997) .Effects of Trust and Governance on Relational Risk. *Strategic Management Journal*, Vol.40 (2), p. 308-338.
- [24] Notebook, B. (1996). Trust, Opportunism and Governance: A Process and Control Model. *Organization Studies*, Vol. 17(6), p. 985-1010.
- [25] Ouchy, W. G. (1980). Markets, Bureaucracies, and Clans. *Administrative Science Quarterly*, Vol. 25, p. 120–142.
- [26] Poppa, L., & Zenger, T. (2002). Do Formal Contracts and Relational Governance Function as Substitutes or Complements. *Strategic Management Journal*, Vol. 23(8), p. 707–725.
- [27] Poppa, Zhou, K.Z. & Ryun, S. (2008). Alternative Origins to Inter-organizational Trust: An Interdependence Perspective on the Shadow of the Past and the Shadow of the Future. *Organization Science*, Vol. 19(1), p. 39-55.
- [28] Purina, P., & Vainest, B.S. (2009). Trust and Governance: Untangling a Tangled Web. *Academy of Management Review*, Vol. 34, p. 11–31.
- [29] Vandaele, D., Rangarajan, D. , & Gemmed, P. (2007). How to Govern Business Services Exchanges: Contractual and Relational Issues. *International Journal of Management Reviews*, Vol. 9(3), p. 237-258.
- [30] Williamson, O.E. (1985). *The Economic Institutions of Capitalism*. New York: Free Press.
- [31] Ritual, P. (2012). Coopetition Strategy -When is it Successful? Empirical Evidence on Innovation and Market Performance. *British Journal of Management*, Vol. 23(3), p. 307–324.
- [32] Ritual, P. & Hurmelinna-Laukkanen, P. (2009). What’s in it for me? Creating and Appropriating Value in Innovation-related Coopetition. *Technovation*, Vol. 29, p. 819–828.
- [33] Sarkar, M.B., Au lakh, P.S., & Macho, A. (2009). Process Capabilities and Value Generation in Alliance Portfolios. *Organization Science*, Vol. 20(3), p. 583-600.
- [34] Schreiner, M., Kale, P., & Corset, D. (2009) .What really is Alliance Management Capability and How does it Impact Alliance Outcomes and Success? *Strategic Management Journal*, Vol. 30(13), p. 1395-1419.
- [35] Tang. (2006). *Organizational Complexity: Assumption, Utility, and Cost*. Tuscaloosa: The

University of Alabama.

[36]Zine din, M (2004). Co-opetition: the Organization of the Future. *Marketing Intelligence & Planning*, Vol. 22(7), p. 780-790.