

Study on the Influence of Network Governance Mechanism on the Value Co-creation of Manufacturing Enterprises

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Abstract. Based on social network theory and dynamic capability theory, this study explores the impact of network governance mechanism on manufacturing enterprises value co-creation. Through the empirical analysis of 412 questionnaires, the results show that network governance mechanism has a significant positive effect on manufacturing enterprises value co-creation, network embeddedness mediates the relationship between network governance mechanism and manufacturing enterprises value co-creation, absorptive capacity moderate the relationship between network embeddedness and manufacturing enterprises value co-creation.

Keywords: Network Governance Mechanism; Network Embeddedness; Manufacturing Enterprises; Value co-creation; Absorptive capacity

1 Introduction

Manufacturing is a pillar industry for national economic development. With the rapid development of the manufacturing industry, Manufacturing enterprises can not achieve long-term development only by relying on internal resources, which promotes the value co-creation. With the deepening of research, how to jointly promote the realization of value between manufacturing enterprises and partners has become a research hot spot.

Value co-creation means that subjects achieve the effect of $1+1>2$ through cooperation. Some scholars use governance theory to study the realization of value co-creation. They believe that the governance mechanism can enable members to fulfill their commitments, and promote value co-creation. Scholars believe that network governance mechanism has an impact on value co-creation, but they have not clarified its specific mechanism.

Existing studies have found that the network relationship between cooperative subjects is closely related to value co-creation. Some scholars believe that embedding can integrate resources, promote value co-creation. Penttilä^[1] found that the establishment of risk avoidance mechanisms can increase the closeness of cooperation, improve the degree of embedding. Therefore, this paper introduces network embedding as an intermediary variable .

Some studies show that the resources in the network do not combine spontaneously to create useful knowledge. Some studies suggest that absorptive capacity can integrate useful resources

for enterprises. Therefore, this paper introduces absorptive capacity to provide a research perspective for value co-creation.

2 Theoretical model and research hypothesis

2.1 Network Governance Mechanism and Manufacturing Enterprise Value Co-creation

Network governance mechanism is a mechanism to ensure the effective operation of the entire cooperative network by maintaining the relationship between manufacturing enterprises and other enterprises. From the perspective of results, manufacturing enterprise value co-creation refers to the interaction between manufacturing enterprises and other enterprises in the cooperative network based on the common goal to meet the market demand. Social network theory holds that any organization exists in the social network, the relationship between organizations can promote value co-creation, network governance mechanism can provide a guarantee for relations. Referring to the other study, this paper divides it into contract and relationship governance mechanism. Contract governance mechanism is a series of mechanisms that regulate the behaviors, supervise the performance and punish the breach of contract of manufacturing enterprises and other enterprises in the cooperation network through certain mandatory means such as contracts. Contract governance mechanism makes things have rules to follow, creates a good cooperation atmosphere, and promotes the value co-creation of manufacturing enterprises.

Relationship governance mechanism refers to a series of coordination mechanisms in which manufacturing enterprises and other enterprises in the cooperative network ensure smooth cooperation through implicit rules such as values and trust. The strong relationship governance mechanism can increase the trust. Manufacturing enterprises cooperate with suppliers to realize resource integration. Manufacturing companies communicate with other companies, form a good relationship. Hence, the following assumptions are proposed:

H1a: The contract governance mechanism positively affects the value co-creation.

H1b: The relationship governance mechanism positively affects the value co-creation.

2.2 Mediating role of network embedding

Network embeddedness is the stable connection formed by enterprises through communication. The stronger the contractual governance mechanism, the more members' awareness of the role of the cooperation network can be improved, and the enterprise can actively embed into the cooperation network. Under the contractual governance mechanism, members enjoy additional rights, and then actively embed into the cooperation network.

The relationship governance mechanism makes the relationship between members more intimate^[2], and realizes the improvement of the level of network embedding. The relationship governance mechanism enables manufacturing enterprises and cooperative entities to virtually form unified resource sharing norms, create an internal atmosphere of equality and trust, and protect the rights and interests of all parties, so that manufacturing enterprises actively

establish contacts with members and improve the degree of network embedding. Hence, the following assumptions are proposed:

H2a: The contractual governance mechanism positively affects the degree of network embeddedness.

H2b: The relationship governance mechanism positively affects the degree of network embeddedness.

Improving the embedding degree of manufacturing enterprises in the cooperation network enables them to obtain more heterogeneous resources and realize the value co-creation of manufacturing enterprises. The deeper the network embeddedness, the closer the relationship between manufacturing enterprises and stakeholders, the more resources they can have, and realize value co-creation of manufacturing enterprises. Hence, the following assumptions are proposed:

H3: Network embeddedness positively affects the value co-creation.

H4a: Network embeddedness plays an intermediary role in contract governance mechanism and value co-creation.

H4b: Network embedding plays an intermediary role in relational governance mechanism and value co-creation.

2.3 The moderating effect of absorptive capacity

Absorptive capacity refers to the ability of an enterprise to identify and integrate external information. Dynamic capability theory holds that absorptive capability, as an important part of dynamic capability, can promote the development of enterprises. Manufacturing enterprises with strong absorptive capacity can quickly integrate external resources, and realize the value co-creation. When the absorptive capacity of the enterprise is weak, even with a high degree of network embeddedness, enterprises have a large number of external resources, but it is difficult for them to convert knowledge into valuable resources, which affects the value co-creation of manufacturing enterprises. Hence, the following assumption is proposed:

H5: Absorptive capacity positively regulates the promotion effect of network embeddedness on value co-creation.

3 Research Design

3.1 Samples and data

In this study, questionnaires were distributed to manufacturing enterprises. The questionnaires were distributed mainly through school MBA students and industry associations. A total of 600 questionnaires were sent out, 486 were recovered, and 412 were valid, with an effective recovery rate of 68.7%.

3.2 Variable measure

The network governance mechanism is divided into two dimensions: the contract governance mechanism and the relationship governance mechanism. Two dimensions refers to the

research of Li Pengli^[3]. Network embedding refers to the research of Yang Xiaoyan^[4]. Value co-creation refers to the research of Li Pengli^[3]. Absorptive capacity refers to the research of Xue Jiaqi et al^[5]. Referring to the research of other scholars, this paper takes enterprise age, scale, nature as control variables.

4 Empirical analysis

4.1 Homologous bias test

The first factor loading obtained before rotation was 37.01%, which was less than 40%, indicating that there was no serious homology bias in the data.

4.2 Reliability and validity test

It can be seen from Table 1 that the Cronbach's α and CR of each variable are both greater than 0.8, indicating that the reliability is good. The AVE of each variable are greater than 0.5, and the CR are greater than 0.8, indicating that the convergent validity is good. It can be seen from Table 2 that the $\sqrt{\text{AVE}}$ of each variable is greater than the correlation coefficient between this variable and other variables, indicating that the discriminant validity is good. Therefore, the scale has good reliability and validity.

Table 1: Reliability and validity of the variable

Variable	Cronbach's α	KMO	Bartlett	CR	AVE
Contract governance mechanism	0.936	0.936	0.000	0.905	0.613
Relationship governance mechanism	0.892	0.903	0.000	0.897	0.594
Network Emddeddedness	0.935	0.963	0.000	0.927	0.539
Absorptive Capacity	0.851	0.803	0.000	0.863	0.612
Value Co-creation	0.95	0.975	0.000	0.946	0.595

4.3 Descriptive statistics

In the Table 2, there is a significant positive correlation between the main variables, and the VIF of each variable is less than 3, indicating that the relationship between the variables can be further studied.

Table2: Correlation coefficient of variables and VIF

variable name	1	2	3	4	5
1 Contract governance mechanism	0.783				
2 Relationship governance mechanism	0.374**	0.771			
3 Network Emddeddedness	0.589**	0.338**	0.734		
4 Absorptive Capacity	0.451**	0.369**	0.440**	0.782	
5 Value Co-creation	0.424**	0.324**	0.305**	0.369**	0.771
VIF	1.014	1.787	1.246	1.578	1.334

4.4 Hypothesis testing

4.4.1 Main effect test

Table3: Hypothesis testing

	Value Co-creation				Network Embeddedness			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Enterprise age	0.326* **	0.233* **	0.277** *	0.233* **	0.250** *	0.240***	0.142*	-0.002
	(7.147)	(5.628)	(6.55)	(5.776)	(6.16)	(5.942)	(2.503)	(-0.043)
Enterprise scale	0.021	-0.003	-0.004	-0.011	-0.022	-0.021	0.072	0.04
	(0.444)	(-0.08)	(-0.095)	(-0.277)	(-0.547)	(-0.513)	(1.243)	(-0.857)
Enterprise nature	-0.013	-0.044	-0.035	-0.045	-0.041	-0.036	0.067	0.009
	(-0.345)	(-1.331)	(-1.067)	(-1.417)	(-1.275)	(-1.112)	(1.463)	(0.238)
Contract governance mechanism		0.220* **		0.137* **				0.420***
		(7.336)		(4.015)				(12.325)
Relationship governance mechanism		0.169* **		0.143* **				0.131**
		(4.613)		(3.964)				(3.135)
Network Embeddedness			0.342** *	0.195* **	0.29***	0.295***		
			(9.514)	(4.519)	(7.959)	(8.174)		
Absorptive Capacity					0.176** *	0.174***		
					(5.139)	(5.102)		
Network Embeddedness×Absorptive Capacity						0.076**		
						(2.92)		
R2	0.12	0.311	0.28	0.346	0.324	0.338	0.027	0.365
Adj-R2	0.113	0.303	0.273	0.336	0.315	0.328	0.019	0.357
F	18.475 ***	36.727 ***	39.523* **	35.633 ***	38.874* **	41.417** *	3.717*	46.601***

In order to test the influence of network governance mechanism on value co-creation, models 1 and 2 are constructed with value co-creation as the dependent variable. It can be seen from Table 3 that model 1 introduces control variables. Model 2 adds two independent variables. It can be seen from the results that the explanatory power of Model 1 is only 11.3%. The explanatory power of Model 2 increases to 30.3%, the contract and relationship governance mechanism have a significant positive impact on value co-creation ($\beta=0.22, 0.169$; p are all less than 0.001). H1a, H1b are established.

4.4.2 Mediation effect test

In order to test the mediating effect, models 3, 4, 7 and 8 were constructed. Models 7 and 8 are models with network embedding as the dependent variable. Model 7 introduces control variables, model 8 adds two independent variables. It shows that both contract and relationship governance mechanism have a significant positive impact on network embedding ($\beta=0.42, 0.131$; $p<0.001, 0.01$), H2a and H2b are established. Model 3 adds network embedding on the basis of Model 1 to test the impact of network embedding on value co-creation. The Adj-R2 increases from 0.113 to 0.273. Network embedding has a significant positive impact on value

co-creation ($\beta=0.342$, $p<0.001$). H3 is established. Model 4 adds network embedding on the basis of Model 2 to test the indirect impact of contracts and relationship governance mechanisms on value co-creation. Comparing models 2 and 4, the Adj-R2 value increases to 0.336. In Model 4, network embedding has a significant positive impact on value co-creation ($b=0.195$, $p<0.001$). The regression coefficient β of the contract and relational governance mechanisms dropped from 0.22 and 0.169 to 0.137 and 0.143, but still significantly (all p are less than 0.001). Therefore, H4a and H4b are established.

4.4.3 Moderation effect test

In order to test the moderating effect of absorptive capacity on network embedding and value co-creation, models 5 and 6 are constructed on the basis of model 3. It can be seen from Table 3 that the Adj-R2 value of model 3 is 0.273, while the Adj-R2 values of models 5 and 6 are 0.315 and 0.328. The regression coefficient of the interaction item of model 6 is 0.076, and the regression effect significantly ($p<0.01$). In summary, H5 is established.

5 Research Conclusions and Discussion

5.1 Research Conclusions

This paper takes manufacturing enterprises as the research object. Through the research, the following conclusions are drawn: (1) Network governance mechanism can promote value co-creation; (2) Network embedding plays an intermediary role between network governance mechanism and value co-creation; (3) Absorptive capacity positively regulates the promotion effect of network embeddedness on value co-creation.

5.2 Management Implications

(1) Improve the network governance mechanism. Manufacturing enterprises should join in the design of the network governance mechanism, clarify its content and ensure usability. (2) Improve the degree of network embedding. Manufacturing enterprises should actively maintain existing contacts, share resources with partners. (3) Manufacturing companies should regularly organize knowledge sharing activities to form a good learning atmosphere within the company.

5.3 Future Research Prospects

This paper has certain limitations and points worthy of further exploration: (1) This paper uses quantitative research methods to study the relationship between variables. Future research can further explore the relationship between variables through case studies. (2) This study measures variables by give manufacturing enterprises questionnaires, which has a certain subjectivity. Future research can measure variables by give manufacturing enterprises and their cooperative enterprises questionnaires. (3) This study did not consider external environmental factors. Future research can incorporate such factors into the research.

Funding. This work was supported by the National Social Science Foundation of China [Grant Number 19BGL017].

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