A Study on the Impact of Inter-firm Trust on Value Co-creation in Manufacturing Firms

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Abstract. Based on social exchange theory, organizational learning theory and other related theories, this paper further analyzes the relationship between inter-enterprise trust, dual learning, knowledge base compatibility and value co-creation based on the characteristics and practicality of manufacturing enterprises, and constructs a theoretical model of inter-enterprise trust affecting value co-creation with dual learning as the mediating variable and knowledge base compatibility as the moderating variable. The results of this paper show that inter-firm trust has a significant positive contribution to value co-creation in manufacturing enterprises; utilization learning and exploratory learning have a significant mediating role in the influence of inter-firm trust on value co-creation; knowledge base compatibility plays a moderating role in the influence path of utilization learning on value co-creation. The moderating effect of knowledge base compatibility between utilizing learning and value co creation.

Keywords: Inter-firm trust; Value co-creation; Exploitative learning; Exploratory learning; Knowledge base compatibility

1 Introduction

Manufacturing enterprises, as an important component of the real economy, rely solely on their own resources and capabilities to quickly enhance their competitiveness. In order to alleviate the pressure of survival and achieve sustainable development, enterprises have gradually realized the importance of openness, and working together with stakeholders to create value and improve corporate performance has become an inevitable trend [1].

Trust between enterprises, as an important variable in studying cooperative relationships between enterprises, lacks corresponding exploration and analysis. For manufacturing enterprises, co creation of value with partners helps them to have a clear understanding of their own development situation, recognize the gap between them, and narrow this gap by actively learning the knowledge and skills of their partners. In addition, the success of a company in absorbing, integrating, and utilizing complementary knowledge and skills learned from its partners depends on the degree of knowledge

B. K. Kandel et al. (eds.), *Proceedings of the 2023 3rd International Conference on Business Administration and Data Science (BADS 2023)*, Atlantis Highlights in Computer Sciences 19,
https://doi.org/10.2991/978-94-6463-326-9_19

overlap and technological compatibility between both partners [2]. Therefore, when exploring the impact of trust between enterprises on value co creation, it is necessary to consider the learning ability of enterprises and the role of knowledge base compatibility between enterprises.

In summary, based on social exchange theory, this study explores the impact mechanism of trust between enterprises on value co creation in manufacturing enterprises, and introduces the concept of dual learning to analyze its mediating role between trust and value co creation between enterprises, as well as the moderating effect of knowledge base compatibility between dual learning and value co creation.

2 Theoretical analysis and hypothesis formulation

2.1 Inter-firm trust and value co creation

McAllister (1995) divided trust into two types when studying interpersonal trust relationships in organizations: cognitive trust and emotional trust [3]. Cognitive trust refers to the trust relationship established between a company and its partners based on a full understanding of each other's abilities, sense of responsibility, and reliability; Emotional trust refers to the trust relationship established between a company and its partners through long-term communication and interaction. The theory of social exchange points out that mutual trust is a guarantee for the long-term maintenance of complex social relationships between entities. Value co creation between enterprises can essentially be seen as a form of social exchange. Manufacturing enterprises and partners push new products or services to the market through interaction and resource integration to obtain value, thereby achieving value co creation.

This study suggests that both parties in a cognitive trust relationship have a certain understanding of each other's ability to complete work, past cooperation performance, and industry reputation, which can deepen identification with partners and reduce uncertainty in the cooperation process. It is a prerequisite and guarantee for manufacturing enterprises to jointly create value. Due to the long-term cooperation and mutual attraction between enterprises, the emotional trust gradually accumulates, making the cooperation parties more open and transparent, with the goal of maximizing the overall interests of the organization. Communication, exchange, and information sharing between enterprises are more frequent, increasing the possibility of facing and solving problems together. Based on this, this article proposes the following assumptions:

H1a: Cognitive trust has a significant positive impact on value co creation.

H1b: Emotional trust has a significant positive impact on value co creation.

2.2 The mediating role of dual learning

March (1991) believes that exploitative learning refers to the process in which a company learns knowledge related to the production of existing products from its partners

and solves problems in current product production and development; Exploratory learning refers to the process in which a company learns knowledge and skills from its partners in other fields to create new products or provide new services [4].

The establishment of a trust mechanism has accelerated the transfer of knowledge and information between enterprises, providing support and guarantee for organizational utilization learning. By utilizing learning, valuable resources from both parties can be complementary and shared, breaking through the limitations of existing knowledge and technology, and having a positive impact on improving the production efficiency of existing products and achieving value co creation for enterprises. Moreover, enterprises that trust each other are more willing to share proprietary knowledge and accurate and comprehensive information with their partners, which is conducive to breaking the knowledge boundary between enterprises and promoting exploratory learning in organizations. Through exploratory learning, manufacturing enterprises can quickly respond to customer needs to grasp new business opportunities, which is conducive to achieving value co creation. Based on this, this article proposes the following assumptions:

H2a: Exploitative learning plays a mediating role between cognitive trust and value co creation.

H2b: Exploitative learning plays a mediating role between emotional trust and value co creation.

H2c: Exploratory learning plays a mediating role between cognitive trust and value co creation.

H2d: Exploratory learning plays a mediating role between emotional trust and value co creation.

2.3 The moderating effect of knowledge base compatibility

In the process of value co creation, manufacturing enterprises inevitably involve the transfer and sharing of knowledge between enterprises [5]. However, due to the sticky, implicit, and causal fuzzy characteristics of the knowledge mastered by enterprises [6], in order to overcome obstacles in the knowledge exchange process and help enterprises understand, digest, and absorb the knowledge of their partners, both partners need to have similar cognitive frameworks and experiences. Based on the above analysis, this article proposes the following assumptions:

H3a: Knowledge base compatibility plays a positive moderating role between exploitative learning and value co creation.

H3b: Knowledge base compatibility plays a positive moderating role between exploratory learning and value co creation.

3 Model and data collection

3.1 Model

Based on the theory of social exchange, this article divides trust between enterprises into two dimensions: cognitive trust and emotional trust to explore their role in the

value co creation of manufacturing enterprises. At the same time, we explored the mediating role of dual learning, which involves both exploitative learning and exploratory learning, as well as the moderating effect of knowledge base compatibility between dual learning and value co creation.

Figure 1 shows the theoretical model of this study:

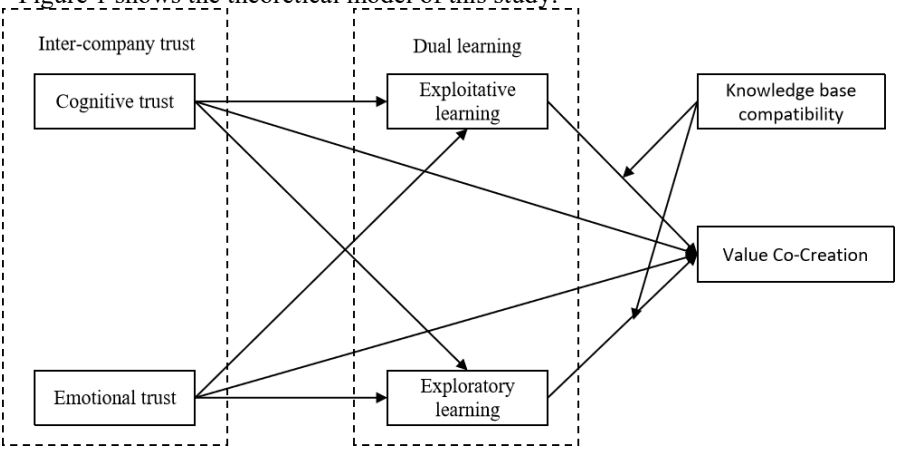

Fig. 1. theoretical model

3.2 Sample selection and data collection

This article collects data through online distribution of survey questionnaires, targeting MBA students and alumni working in manufacturing enterprises. To ensure the reliability and validity of the survey questionnaire, all variables were measured using a mature scale. All items were based on the Likert 5-level scale, with values ranging from "very inconsistent" to "very consistent" represented by values ranging from "1" to "5". Meanwhile, this article draws on existing literature and introduces enterprise age, enterprise size, enterprise nature, and industry domain as control variables to eliminate the impact of unrelated variables on the empirical results. Enterprise size is measured by the number of employees in the enterprise.

The formal survey lasted from October to December 2022, with a total of 453 questionnaires distributed and collected. By excluding questionnaires with short response times and obvious non-compliance, a total of 382 valid samples were obtained, with an effective rate of 84.3%.

4 Results

4.1 Reliability and validity testing

To test the reliability and validity of the empirical results, SPSS23.0 and AMOS24.0 software were used to test the reliability and validity of the sample data. The results are shown in Table 1:

In terms of reliability, Cronbach's of each variable α The coefficients are all greater than 0.8, indicating that the scale used in this study has high internal consistency. Secondly, in terms of validity, the measurement scales used in this study were all selected from mature scales in domestic and foreign literature, thus having good content validity. The combined reliability (CR) of each variable is greater than 0.8 and the average extraction variance (AVE) is greater than 0.5, indicating that the scale items have good convergence validity.

Table 1. Reliability, validity, and correlation test results

variable	1	2	3	4	5	6	Cronbach's α	CR	AVE
1.Cognitive trust	1.000						0.861	0.861	0.554
2.Emotional trust	0.477**	1.000					0.857	0.858	0.548
3.Exploitative learning	0.457**	0.474**	1.000				0.827	0.828	0.617
4.Exploratory learning	0.375**	0.480**	0.381**	1.000			0.826	0.828	0.616
5. value co creation	0.503**	0.554**	0.474**	0.408**	1.000		0.827	0.828	0.618
6.Knowledge base compatibility	0.040	0.133**	0.065	0.042	0.066	1.000	0.896	0.896	0.520

Pour： **express $p < 0.01$.

4.2 Correlation analysis

This study uses the Person correlation coefficient method to test the correlation between various variables.The results are shown in Table 1.

It can be concluded that there is a significant positive correlation between the five variables of cognitive trust, emotional trust, exploitative learning, exploratory learning, and value co creation; Knowledge base compatibility, as a moderating variable, only has a significant positive correlation with emotional trust, and there is no significant correlation with other variables. However, it does not affect the moderation test and can be further analyzed.

4.3 Hypothesis testing

This study uses hierarchical regression analysis to test the direct impact of trust between enterprises on value co creation and dual learning. The results are shown in Table 2:

According to Model 1, assuming H1a and H1b are effective, cognitive trust(β= 0.273, $p<0.001$) and emotional trust(β= 0.337, $p<0.001$) has a significant positive impact on value co creation.

Table 2. Direct effect test results

variable	value co creation		
	Model1	Model2	Model3
Enterprise age	-0.019		
Enterprise size	-0.019		
Enterprise nature	0.043		
Industry Sector	-0.013		
Cognitive trust	0.273***		
Emotional trust	0.337***		
Exploitative learning		0.404***	
Exploratory learning			0.331***
Knowledge base compatibility		0.032	0.036
Exploitative learning × Knowledge base compatibility		0.087*	
Exploratory learning × Knowledge base compatibility			0.075

Pour: *express $p<0.1$; ***express $p<0.001$.

4.4 Mediation effect test

This study used the Bootstrap method to test whether the mediating effect of binary learning is significant, as shown in Table 3.

Table 3. Bootstrap Mediation Effect Test Results

	Effect value	Error	Boot LLCI	Boot ULCI	Relative effect value
Path1:Cognitive trust→Exploitative learning→Value co creation					
Indirect effect	0.125	0.029	0.072	0.184	28.28%
Direct effect	0.317	0.047	0.226	0.412	71.72%
Total effect	0.442	0.051	0.342	0.546	
Path2:Emotional trust→Exploitative learning→Value co creation					
Indirect effect	0.107	0.024	0.061	0.157	23.46%
Direct effect	0.349	0.049	0.255	0.449	76.54%
Total effect	0.456	0.052	0.353	0.557	
Path3:Cognitive trust→Exploratory learning→Value co creation					
Indirect effect	0.084	0.024	0.040	0.135	19.00%
Direct effect	0.358	0.048	0.264	0.454	81.00%
Total effect	0.442	0.051	0.342	0.546	
Path4:Emotional trust→Exploratory learning→Value co creation					
Indirect effect	0.073	0.024	0.027	0.122	16.01%
Direct effect	0.383	0.052	0.280	0.484	83.99%
Total effect	0.456	0.052	0.353	0.557	

The test results for Path 1 indicate that the indirect effect of cognitive trust on value co creation through exploitative learning is 0.125, and the 95% confidence interval is [0.072, 0.184], excluding 0,therefore, the mediating effect of utilizing learning between cognitive trust and value co creation is significant, assuming H2a holds; The test results for path 2 indicate that the indirect effect value of emotional trust on value co creation

through exploitative learning is 0.107, and the 95% confidence interval is [0.061, 0.157], excluding 0,therefore, the mediating effect of exploitative learning between emotional trust and value co creation is significant, assuming H2b holds; The test results for path 3 indicate that the indirect effect of cognitive trust on value co creation through exploratory learning is 0.084, and the 95% confidence interval is [0.040, 0.135], excluding 0,therefore, the mediating effect of exploratory learning between cognitive trust and value co creation is significant, assuming H2c holds; The test results for path 4 indicate that the indirect effect value of emotional trust on value co creation through exploratory learning is 0.073, and the 95% confidence interval is [0.027, 0.122], excluding 0,therefore, the mediating effect of exploratory learning between emotional trust and value co creation is significant, assuming H2d holds.

4.5 Verification of regulatory effects

This study uses the hierarchical regression analysis method to test the moderating effect of knowledge base compatibility between dual learning and value co creation. The test results are shown in Table 2:

According to Model 2, it can be seen that the coefficient of the interaction between the utilization learning and the compatibility of the knowledge base is significant and positive(β= 0.087, $p<0.1$), indicating a significant positive moderating effect of knowledge base compatibility on utilizing learning to promote value co creation, assuming H3a holds; According to Model 3, the coefficient of the interaction between exploratory learning and knowledge base compatibility is positive but not significant, indicating that knowledge base compatibility does not play a moderating role between exploratory learning and value co creation, assuming H3b is not valid.

5 Conclusions

Trust between enterprises has a positive impact on the value co creation of manufacturing enterprises. Mutual trust between enterprises is an important influencing factor for manufacturing enterprises to achieve value co creation. Strengthening the trust relationship between both parties in cooperation can help reduce the occurrence of opportunistic behavior between enterprises, thereby promoting the joint realization of value creation by both parties.

Dual learning plays a partial mediating role in the trust between enterprises and the value co creation of manufacturing enterprises. Trust between enterprises can not only directly affect the value co creation effect of manufacturing enterprises, but also promote the realization of value co creation by promoting the learning of valuable knowledge, skills, and other resources between both partners.

Knowledge base compatibility has different moderating effects between dual learning and value co creation in manufacturing enterprises. Knowledge base compatibility has a significant moderating effect on utilizing learning to promote value co creation, while it has no significant moderating effect on exploring learning to promote value co creation.

ACKNOWLEDGMENTS

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

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