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Impact of Relationship Level with Carrier for Logistics Performance

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Abstract: The intensification of the market competition makes more and more enterprises will be outsourcing of logistics transportation. According to the research objective, based on trust, communication, commitment, adaptation, interdependence and cooperation 6 factors as factors that measure the relationship level, 5 indexes were selected to reliability, quality of service, transportation cost, inventory cost, flexible to reflect the enterprise logistics performance, through the investigation and analysis of data on 74 bamboo products companies in Anji of Zhejiang, China, found that there is a significant positive correlation between the relationship level and enterprise logistics performance, strengthen the relationship management can effectively improve the logistics operation performance.

Key words: Carrier, relationship level, logistics performance

INTRODUCTION

With the increasingly fierce market competition, more and more small and medium-sized manufacturing enterprises begin to focus on their core competitiveness, outsourcing their side line of businesses, especially to outsource logistics business to the third party logistics enterprise is the general choice of more and more enterprises. However, in China, logistics outsourcing enterprises, these cooperative relations between most enterprises and their carriers is still in the transaction stage and primary phase of cooperation, the cooperation is not an ideal situation. Researching the cooperation between enterprises and carriers, strengthen management, whether it can improve the operation efficiency of logistics, so as to enhance enterprise performance?

Transaction costs theory considered that the supply chain relationship is to decrease uncertainty risk and assets specificity by the means of structural management. Resource dependence theory indicates the supply chain relationship could help companies gain some irreplaceable resource that they want. Based on above theories, from different dimensions, scholars studied the way to measure the level of relationship. MP (Industrial Marketing and Partnership Group) pointed out that relationship level reflects a kind of atmosphere or climate about relationship, which includes trust, suitability, communication, mutual cooperation and so on (Li and Zhang, 2007), which approved and indicated that the managers should regarded these elements as an integrate whole, so as to improve the relationship with the up and downstream firm (De Burca *et al.*, 2001).

Scholars have different opinions about how to measure the supply chain performance, but after the literature review and trying to find out the similarity, we find some core indicators included generally, such as reliability, cost, flexibility, quality and responsiveness, like SCOR Model. However, it may be different in choosing indicators for different purpose.

INDEX DESIGN AND DATA ACQUISITION

Index design: From the above literature review, evaluation on the relationship between supply chain enterprises, more use of the concept of supply chain relationship level, namely a degree that the two parties participation in a positive, long-term cooperation in a supply chain. Its research dimensions are consistent, generally including trust, communication, commitment, mutual dependence, adaptation and cooperation in 6 aspects. Because these 6 indicators are more representative, this study also as a basis to describe the relationship between the enterprise and the carrier.

Trust refers to the enterprise that the other party to fulfill their degrees of commitment. The questionnaire designed the enterprise to think the trust level with carrier, whether to believe the carrier in the enterprise when required to provide timely help, carriers of the business secrets confidential degree as well as the carrier of commercial credit problems to reflect on both sides of the issues of trust. Communication refers to the exchange of information between enterprises, the questionnaire by mutual information exchange frequency speed and the content of information exchange to reflect. Commitment

Table 1: Basic information of samples

Enterprise characteristics	No. of enterprises	Ratio (%)
Annual sales		
500 below	17	23.0
500-1000	48	64.9
Above 1000	9	12.1
Staff No. (person)		
100 below	15	20.3
100-500	46	62.2
Above 500	13	17.5
Cooperation time (year)		
1 year below	8	10.8
1-3 years	44	59.4
3-5 years	17	23.0
Above 5 years	5	6.8

Above data is effective as of December 31, 2011

refers to the enterprise whether to be willing to promise to establish long-term friendly relations of cooperation with the carriers and whether to be willing to make the greatest efforts to maintain the cooperation between the two sides and loyal to each other. Adaptation, namely between enterprises in the process of cooperation to make the appropriate changes to adapt to each other's development, the questionnaire includes production system and transportation and equipment investment.

Interdependence between enterprises, namely, whether produced dependence, its production and sales or business goals whether to rely on each other to achieve. Cooperative attitude refers to mutual respect and cooperation among enterprises.

In addition, according to the research objective, this paper selects reliability, quality of service, transportation cost, inventory cost, flexible five indicators to reflect the enterprise logistics performance. Among them, the reliability is the single rate, on time delivery, delivery accuracy and rapid response to the owner to reflect. Service quality through online carrier inquiry service, cargo damage rate, rate of customer complaints and transport speed to inspect; transportation cost and inventory cost reflects the efficiency of input and output, based on the rationality of the carrier transport prices, to the enterprise inventory turnover and the inventory holding cost to study the influence of; logistics operation flexibility is mainly from product flexible, time flexibility and flexible quantity three aspects to reflect.

Likert five levels scale was used to measure the above indicators, the question design adopted the options of "agree extremely, agree relatively, general, disagree relatively and very disagree" and gave them values from 5 to 1, so as to statistical analysis.

Selection of samples and their basic situation: The findings of this research is based on Zhejiang province Anji county bamboo products manufacturing enterprises. Zhejiang Anji is a Chinese famous town, with bamboo

forest area of 67000 ha, in 2011 the output value of 4.6 billion, is a country named "hometown of bamboo in China". Bamboo products manufacturing enterprises. Anji in Zhejiang province is a Chinese famous town, with bamboo forest area of 67000 ha, in 2011 the output value of 4.6 billion, is a country named "hometown of bamboo in China". With the advancement of technology, the bamboo product category increases continuously, the product has an excellent reputation for its quality at home and abroad. With the support of the government, the number of Anji county bamboo products enterprises increased year by year, the scale also has expanded each year. In Anji, as of December 2011, there has more than 150 bamboo products processing enterprises with considerable scale. The investigation of which there are 80 representative enterprises to collect the relevant data. Questionnaire in the form of field research, including six companies because there is no transportation outsourcing as invalid questionnaires, so recycling effective questionnaire 74, the effective recovery rate reached 92.5%. So the result is effective.

From the respondents, most of interview for department manager and above positions of employees, consistent with the survey of this study object, the general manager level (18%), manager level accounted for 65%, general staff accounted for 17%. Surveyed employees number is differ, but mostly sales scale in 5, 000,000 Yuan of above the investigation of the basic situation of enterprises is shown in Table 1.

Because each of the surveyed enterprises have cooperative relations with more than one carrier, can not understand all carriers. Thus, questionnaire only for cooperation and a carrier of understanding, the general is the most key partners. According to the survey, respondents and carrier cooperation time mostly in 1-5 years and the majority of enterprises cooperation time to focus on the following 3 years, 3 years or above accounted for less than 30%.

DATA PROCESSING AND ANALYSIS

Current relationship status with carriers: In order to reflect the level of relationship between sample enterprises and the carrier, by calculating the arithmetic mean value index of relationship between the levels of consideration in data processing. From Table 2, can see the average index that reflect the relationship between the carrier and the trust level and the communication level is higher, all above 3.5, the degree of interdependence and adaptation level is low, two indexes were lower than 3.

Status of enterprise logistics performance: According to the research objective, this paper selected the reliability, service quality, transportation cost, inventory cost, flexible five indicators to reflect the efficiency of logistics operations. From the Table 3, the majority of enterprises think that transported through outsourcing of the logistics performance has a great help to improve the reliability of transportation, which is the most obvious, indicating the carrier during transport to use its advantages, can quickly response to enterprise's demand, at the same time to ensure on time delivery and delivery accuracy, but the level of service of the average value is low, only 2.8696, that the carriers service level there is still much room for improvement.

Correlation analysis of the carrier relationship level and the operation efficiency of logistics: Whether the carrier relationship level has influence on the enterprise logistics

performance or not? Effect how? In order to confirm the relationship between the two factors, this study uses SPSS software to analyze the data.

The data shows, the level of trust and operation carrier relationship management of logistics service level, reduce the reliability, correlation between transportation cost and inventory cost are significant, significant probability are less than 0.01. Trust helps to strengthen the confidence of cooperators, thus increasing both the input of cooperation, make the cooperation more and more high quality, so that create more benefits of cooperation.

Effective and timely communication between both cooperators can avoid unnecessary conflicts; improve the operational efficiency of enterprise. The data in Table 4 verified this hypothesis, the correlation coefficients of the operational efficiency of communication level and each indicator of enterprises are very high and the significant probability Sig. <0.01.

Both sides of the transaction commitment is a consistency guarantee, which is the same with the trust to encourage mutual investment through collaboration, resist the temptation to maintain short-term, stable cooperation, Besides, commitment makes both sides believe there will be no other opportunistic behavior. Therefore, commitment has become the key for establishing solid relationship of the third-party logistics. The data shows that the commitment level exhibits very high positive effect on the logistics performance, significant probability is less than 0.05.

Table 2: Relationship status with carriers

Indicators	Trust level	Communication level	Promise level	Adaptation level	Interdependence degree	Cooperation attitude
Mean	3.74460	3.51430	3.39110	2.64130	2.33150	3.38040
Standard deviation	0.58092	0.80409	0.76932	0.84105	0.69132	0.58390

Table 3: Evaluation on its logistics efficiency

Indicators	Reliability	Service level	Transportation cost	Inventory cost	Flexibility
Mean	3.84780	2.86960	3.42700	3.64500	3.45670
Standard deviation	0.51229	0.48802	0.69523	0.52768	0.58106

Table 4: Correlation coefficients between the carrier relationship level and the logistics performance

Parameters	Trust level	Communication level	Commitment level	Adaptation level	Interdependence degree	Cooperation attitude
Reliability						
Pearson correlation	0.805**	0.708**	0.660**	0.225	0.518**	0.453**
Sig. (2-tailed)	0.000	0.000	0.000	0.133	0.000	0.002
Service level						
Pearson correlation	0.727**	0.549**	0.573**	0.276	0.514**	0.441**
Sig. (2-tailed)	0.000	0.000	0.000	0.063	0.000	0.002
Transportation costs						
Pearson correlation	0.648**	0.658**	0.681**	0.478**	0.368*	0.650**
Sig. (2-tailed)	0.000	0.000	0.000	0.001	0.032	0.000
Inventory costs						
Pearson correlation	0.477**	0.528**	0.356*	0.608**	0.352*	0.496**
Sig. (2-tailed)	0.001	0.000	0.015	0.000	0.021	0.000
Flexibility						
Pearson correlation	0.305	0.454**	0.517**	0.389**	0.437**	0.518**
Sig. (2-tailed)	0.062	0.002	0.000	0.008	0.002	0.000

***: Correlation is significant at the 0.01 level (2-tailed), *: Correlation is significant at the 0.05 level (2-tailed)

As we all know, there are many differences between manufacturing enterprises and carriers in the cooperation process. Both sides need to make appropriate changes to match each other's needs and developments. In Table 4, the data shows that between adaptation level and reduce logistics costs, improve operational flexibility has a significant impact a significant probability of Sig. <0.01.

If both partners are aware of the partnership will bring greater benefits and these benefits are not gained by unilateral or other alternatives available, such an awareness will help to enhance the inter-organizational adaptability and interoperability, promote investment and make it easier to see the positive factors in the relationship of cooperation. The results showed a significant correlation between the degree of interdependence and each indicator of enterprises' operational efficiency and thus indicates that the greater the degree of interdependence, the higher the reliability of logistics and service level, the greater the logistics operation flexible, finally it will play a significant role in reducing transportation costs and inventory costs.

When enterprises determined cooperation with carriers, the cooperative attitude is essential in the carriers relationship, which reflects both partners' respect and attention for each other. The data in Table 4 also shows this view, significant correlation of cooperative attitude and probability reflects the enterprise logistics performance of each index were less than 0.01, indicating good cooperative attitude is the key to decide the operation efficiency.

Regression analysis: In order to study on the impact of carrier relationship management to the enterprise operation efficiency of the logistics, this paper calculated the average score of logistics performance of each index and takes it as the dependent variable, stepwise regression analysis on the operation efficiency of the logistics of the 6 indicators to make the carrier level using SPSS software.

Through the regression analysis from the carrier relationship level on the logistics performance, where Y is using to express the level of enterprise logistics performance and X1, X2, X3, X4, X5, X6 are the variables to reflect the carrier relationship level respectively, this study establishes the model as follows: $Y = 1.176 + 0.307 X1 + 0.179 X2 + 0.207 X6$, where X1, X2, X6 denote trust level, communication level and cooperative attitude respectively. $R^2 = 0.749$, which illustrates the model better fits.

Importance of cooperation time: For the manufacturing enterprises and not every cooperation of the carrier has

equal value. Enterprise must maintain valuable partnerships if they want to survive and develop. However, the partnerships with carriers have obvious periodic characteristics, carrier's loyalty from germination to maturity to go through a continuous development of evolution process.

According to the data, it is not difficult to find that, the cooperation time has a high correlation coefficient with trust level (0.440), communication level (0.519), commitment level (0.352), adaptation level (0.459) and cooperation attitude (0.394), the levels of significant probability (Sig.) are all less than 0.05. It is easy to explain this, maintaining a high level of trust and good communication will encourage the both sides to keep long-time cooperation, but the long-time cooperation will make them be willing to commit and do more efforts in adaptation to each other, showing a better cooperation attitude.

CONCLUSION

Base on the research of 74 bamboo products companies in Anji, the results show that between the enterprise and the carrier relationship level exhibits significant correlation on the logistics performance, especially the three indicators on both sides of the level of trust, communication and cooperative attitude, a linear correlation with the logistics performance, directly affects the efficiency of the operation of enterprises logistics index. The results also imply that long-time cooperation can help the partners enhance the trust level, communication level, commitment level and adaptation level. These conclusions do have important practical significance, for the manufacturing enterprises which chose logistics outsourcing.

Improving communication and trust between the enterprises and the carrier: The enterprise should bring the carrier into their own management system, from the operation process, personnel arrangements to develop customer satisfaction, share their management, corporate culture, management mechanism with the carrier. Communication and sharing is beneficial to both sides to build mutual trust, so that the carriers and enterprise can stand in the same position then in the face of the user, the two sides formed a close connection with the partnership.

Establishment of strategic alliances with excellent carrier, keeping the stable cooperation relationship: The survey found that the average time of 74 sample enterprises cooperating with their carriers is only two years; reflects most enterprise and carrier signed all the

short-term trading logistics contract. Short-term cooperation between the two sides is very difficult to build trust, cannot be very good communication, both sides are unwilling to make a commitment and efforts to enhance adaptability. Long-term and stable relations of cooperation are beneficial to both sides to reach the level of relationship better, so as to improve the efficiency of logistics operation.

To carry out differentiated services, improve service level, improve the dependence on the carriers for enterprise: The results showed that increase the interdependence between enterprises and carriers helps to improve the efficiency of logistics operations. However, the majority of logistics offer homogenization services, lack of specific assets investment, competition means are single, which is why it is difficult to enhance dependence on carrier for enterprise, key factors affecting both the structure of strategic alliance. The carriers want to get out of the vicious cycle of competition, should try various devices to carry out differentiated services, build the service characteristics and actively carry out special assets investment, such as in order to adapt to the production process or product characteristics, specific transformation of the means of transport, or the purchase of special equipment, it increases the lever of the carriers

to adapt to the enterprises at the same time, also to increase their dependence on it, to help secure its partnership.

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