

## **Mediating Effect of Transaction Costs in Supply Chain Relationships: An Empirical Examination**

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Track: Inter-Organizational Relations  
(or Operations, Logistics and Supply Chain Management)

**Word count:** 1,931 words (excluding acknowledgement and references)

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### **Summary**

Previous research has found a positive impact of inter-firm trust on business performance and many authors have postulated that transaction costs between the firms mediates such an impact. However, literature has rarely tested this mediating effect. The objective of this research is to test such an effect. In order to do this we have developed a measurement device for transaction costs, inter-firm trust and business performance. This was then validated using an exploratory factor analysis. To test the mediating effect of the transaction costs, we analysed a set of multiple regression models using data from the tourism sector in Thailand. To further develop this research, we plan to compare the perspectives of supply chain members. We also aim to use a statistical technique called Structural Equation Model to validate all hypotheses simultaneously.

## 1. Introduction

As firms aim to maintain a long-term relationship with their business partners, researchers have suggested that trust between supply chain partners is a critical factor for success (Mentzer et al., 2001; Christopher, 2011). Several studies suggest that inter-firm trust could lead to better business performance (Ireland and Webb, 2007) especially for logistics activities (Kwon and Suh, 2004), which refer to the "*firm's ability to deliver goods and services in the precise quantities and at the precise times required by customers*" (Green et al., 2008). The impact of inter-firm trust is arguably mediated by the costs of transactions (Nyaga, et al., 2009; Sriram, et al., 1992). It is believed that transaction costs can be reduced by a higher level of inter-firm trust which then leads to better logistics performance (Grover and Malhotra 2003; Pilling, et al. 1994). However, researchers have seldom included transaction costs as a mediating variable in their studies. This research aims to fill that gap in the literature by answering the following question:

*"Does the transaction cost actually mediate the impact of the inter-firm trust on the firm's logistics performance?"*

## 2. Theoretical background

Coase (1937) first used the term, *transaction costs*, to explain the existence and the boundary of the firm. He argued that there is always a cost incurred when firms do their business externally. Two main assumptions that support his argument are opportunism and bounded rationality (Williamson, 2008). Firstly, firms always seek to take an advantage of their partners with guile. Thus firms need to monitor the performance of their partner to prevent any potential opportunistic behaviour (Grover and Malhotra, 2003). Secondly, even when firms try to prevent such behaviours; they are not able to do so since humans are either limited in their cognitive ability or they exhibit *bounded rationality* (Simon, 1957). Therefore, Coase (1937) and other researchers, (e.g., Williamson, 1993; and Pilling et al. 1994), have argued that transaction cost is a factor that determines whether an operation should be conducted within the firm, *as a hierarchical transaction*, or outside the firm, *as a market transaction* (Coase, 1937). Williamson (2008) showed to maximise the business performance from a market transaction firms need to minimise their transaction costs. This could be done by the building up inter-firm trust with their supply chain partners. However, this argument has rarely been tested by empirical research.

## 3. Research hypotheses

### 3.1. Inter-partner trust

Trust is argued to be a critical factor in developing supply chain relationships (Christopher, 2011; Simatupang and Sridharan, 2002; Williamson, 2008) because it could eliminate unnecessary activities that firms need to do to prevent opportunistic behaviour from their supply chain partners. When firms believe that their partner is trustworthy, transaction costs such as those associated with monitoring and performance measurement can be reduced. Moreover, firms with high levels of trust tend to produce better logistics performance (Green et al., 2008; Sriram et al., 1992). Thus, we propose the following hypotheses:

**H1:** *Inter-partner trust has a negative impact on transaction costs.*

**H2:** *Inter-partner trust has a positive impact on logistics performance.*

### 3.2. Transaction cost

When a transaction requires specific investment, the cost of such a transaction will increase. Firms may expect their partners to take advantage of them if opportunistic behaviour cannot be easily detected (Williamson, 1993). However when firms recognise behavioural deviation (uncertainty) from their partners, they should monitor partner performance in order to prevent damage from opportunism. This argument leads to the following hypothesis.

**H3:** *Asset specificity has a positive impact on transaction costs.*

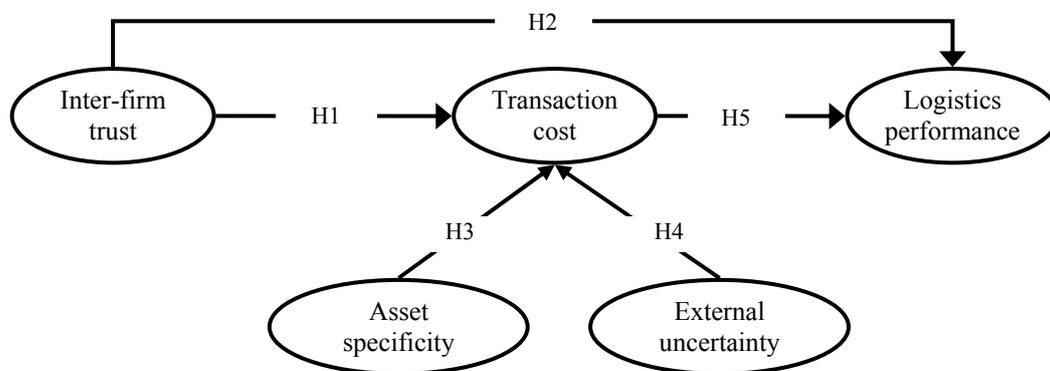
**H4:** *External uncertainty has a positive impact on transaction costs.*

Many researchers suggest that transaction costs have a mediating effect on the impact of the inter-firm trust on logistics performance of the firms but this is rarely tested. Thus we propose the following hypothesis.

**H5:** *Transaction costs have a negative impact on logistics performance.*

Considering the research hypotheses discussed previously, we explicitly propose a hypothesis that transaction costs mediate the impact of the inter-firm trust on the logistics performance (combining H1 and H5). Moreover, we also propose a hypothesis that inter-firm trust has a direct effect on logistics performance (H2).

Figure 1 represents the structure of our research model in this study.



**Figure 1: The research model**

## 4. Research Methodology

### 4.1. Data

The tourism sector is chosen as the context of this research as it makes a significant contribution to the economy and has both product and service characteristics. Specifically, we considered the dyadic relationship between hotels and their suppliers and travel agents. We collected data from a survey using self-administrated questionnaires. According to Churchill (1979), we adapted measurement items from

existing scales in the relevant literature. To develop the questionnaire, we asked 11 tourism practitioners and four academics to validate the measurement items (Table 1). As we conducted a survey in Thailand, the contents of the questionnaire were initially developed in the English language and independently translated to Thai language later by two experts from a *Tourism Business Association* and the *Language Institute of Chiang Mai University* in Thailand. The questionnaires were printed and distributed in the annual meeting of the Tourism Business Association. We obtained 109 usable responses from hotels, suppliers and travel agents and these were subsequently analysed. Respondents were asked to answer the questions considering the product that is important to their organisation and well known by them.

#### 4.2. Analysis method

We tested the reliability of the data using Cronbach's  $\alpha$ . Using Principle Component Analysis we then generated constructs from the questionnaire items. The research hypotheses were then tested using a Multiple Regression Analysis with the Ordinary Least Square method (Hair et al., 2010).

**Table 1: Summary of the measurement**

Construct	Operational definition	Source
Asset specificity	The specific asset investments in resources, procedures, and people made by the partner in their partnership with the respondent firm	Kwon and Suh (2005)
External uncertainty	The inability to predict partner behavior or changes in the external environment.	Kwon and Suh (2005)
Inter-firm trust	Partners perceive each other as credible and benevolent.	Robson et al. (2008), Nyaga et al. (2009)
Transaction cost	A cost incurred in making an economic exchange with another organization.	Grover and Malhotra (2003), Williamson (2008)
Logistics performance	The organization's performance as it relates to its ability to deliver goods and services in the precise quantities and at the precise times required by customers.	Green et al. (2008)

## 5. Results

We found that all five constructs are highly reliable as the Cronbach's  $\alpha$  was greater than 0.7. The factor analysis with the Varimax rotation method yielded factor loadings of greater than 0.7 with the exception of the first item of transaction cost (Table 2). We then used those factor loadings to estimate the value of the constructs using a regression method. The statistical software, *SPSS16.0* was used to perform the

analysis. The results from the multiple regression models show all five hypotheses were statistically supported at  $p < 0.10$  (Table 3). The results confirm that inter-firm trust has both a direct positive impact on logistics performance and also an indirect effect via a reduction in the transaction costs. Moreover, the results show that the antecedents of transaction costs are asset specificity and business uncertainty as suggested in the literature (Coase, 1937; Williamson, 2008).

**Table 2: Construct measures with reliability, factor loading, and t-value**

Survey items	Factor Loading
Asset specificity ( $\alpha = .878$ )	
<i>In building the relationship with my firm, this supplier... ... has an operating process that has been tailored.</i>	0.944
<i>... has made specific investments in resources.</i>	0.944
External uncertainty ( $\alpha = .874$ )	
<i>My firm can accurately predict the performance of this supplier in our next transaction.</i>	0.943
<i>My firm knows that this supplier will adapt quickly, should we have change our specifications at short notice.</i>	0.943
Inter-firm trust ( $\alpha = .823$ )	
<i>My firm can understand this supplier well.</i>	0.860
<i>This supplier is genuinely concerned that we succeed.</i>	0.899
<i>We trust this supplier keeps our best interests in mind.</i>	0.770
<i>This supplier/buyer considers our welfare as well as its own.</i>	0.723
Transaction cost ( $\alpha = .803$ )	
<i>It was easy to work out the main issues and necessary details.</i>	0.628
<i>We are in good position to evaluate how fairly this supplier deals with us.</i>	0.845
<i>There are no incentives for this supplier to take advantage of the relationship with our firm.</i>	0.813
<i>It is difficult for this supplier NOT to keep the promise.</i>	0.880
Logistics performance ( $\alpha = .971$ )	
<i>This relationship has ...</i>	
<i>... improved our order processing accuracy.</i>	0.960
<i>... improved our on-time delivery.</i>	0.889
<i>... increased our forecast accuracy.</i>	0.936
<i>... improved our order accuracy in term of product types.</i>	0.967
<i>... improved our order accuracy in term of product quantity.</i>	0.979

Note:  $\alpha$  = Cronbach's  $\alpha$

**Table 3: Summary of multiple regression models**

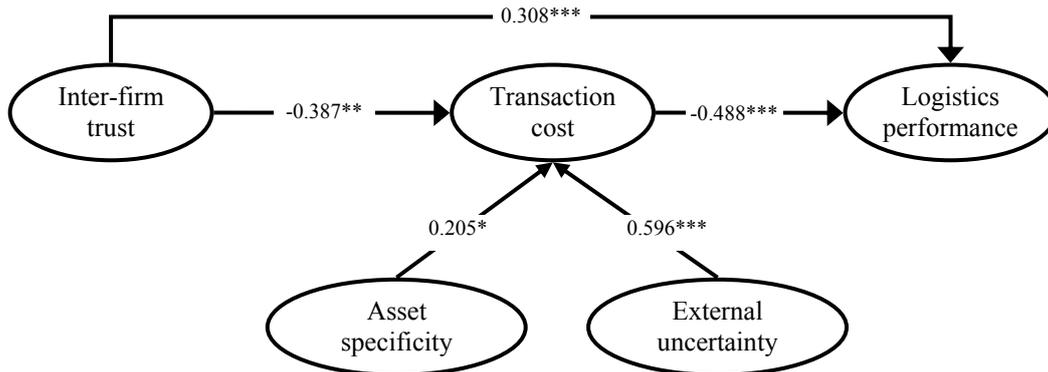
Model	Dependent variable	Independent variables	Coefficients (Standardised)	Hypotheses support
1	Transaction cost (R <sup>2</sup> = .637)	Asset specificity	0.205*	Supported
		External Uncertainty	0.596***	Supported
		Inter-firm trust	-0.387**	Supported
2	Perceived performance (R <sup>2</sup> = .654)	Inter-firm trust	0.308***	Supported
		Transaction cost	-0.488***	Supported

Note: \* =  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 6. Conclusion

Previous research has often argued, without empirical evidence, that transaction cost is a mediator of the impact of inter-firm trust on the firms' business performance. In this study, we collected data from the tourism sector in Thailand to test that mediating effect. The results in the factor analysis and the multiple regression models show that the impact of inter-firm trust on logistics performance is partly mediated by the reduction of transaction costs between firms.

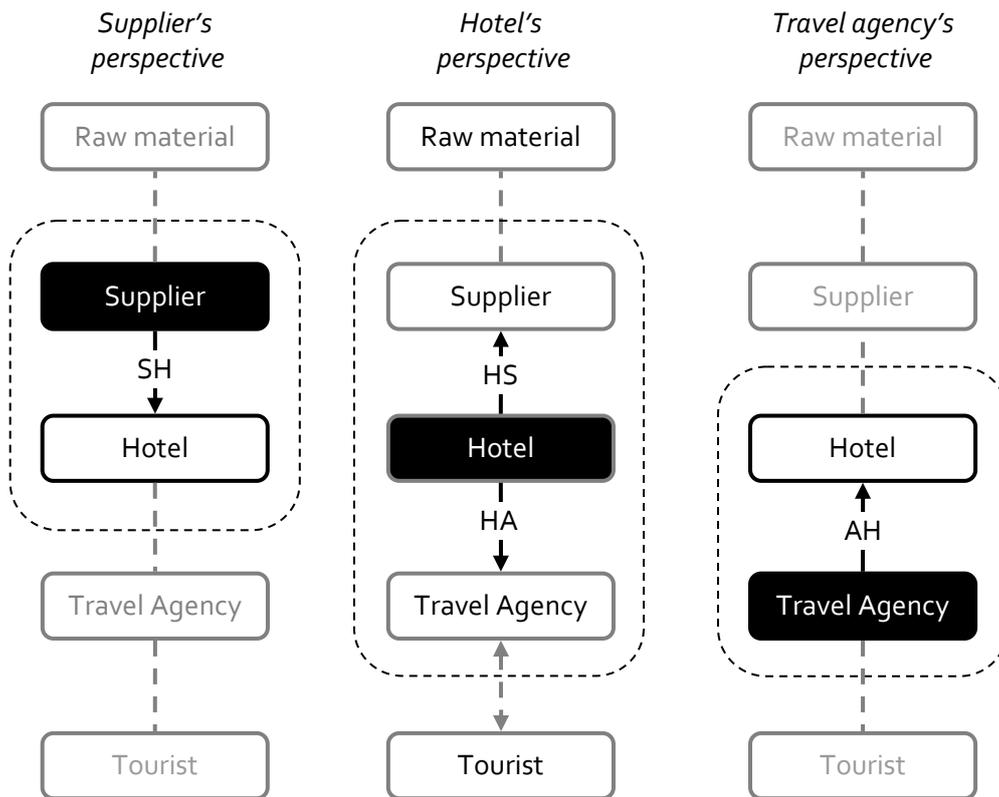
The result of this study shows that transaction costs in the supply chain mainly stem from external uncertainty in the business environment. Also the specificity of the investment in assets needed to establish their business also give rise to the transaction costs between them. However the enhanced level of trust between the two could reduce such transaction cost, which would further improve their business performance.



**Figure 2: Results from the multiple regression models**

## 7. Plan to develop the paper

Since our research hypotheses are aligned in the single conceptual model (Figure 1), these hypotheses should be tested simultaneously. Therefore we plan to validate all the hypotheses using a *structural equation model* (SEM). However, SEM may need a larger sample size ( $n > 250$ ). Moreover, with larger samples we can also include other critical constructs such as "relationship satisfaction" and "commitment". Furthermore, we aim to compare the different perspectives in the tourism supply chains, for example, the supplier's perspective vs. the hotel's perspective Zhang, et al., (2009), via four surveys that cover three aspects of tourism service providers suppliers and tour operators (Figure 3).



Note: Firms in the black boxes will be asked to evaluate their business transactions with the firm pointed to by the arrows.

**Figure 3: Model comparison framework**

### Acknowledgement

The authors are grateful to the Royal Thai Government through the Commission on Higher Education for the financial support of this study (under the program of Strategic Scholarships for Frontier Research).

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