

# 科技部補助專題研究計畫成果報告 期末報告

## 從社會資本的觀點探討供應鏈買方績效的影響原因

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中文摘要：大部分基於社會資本理論探討在買賣雙方關係中的績效差異性的研究，僅使用社會資本的關係資本或/及結構資本元素的影響性，這種做法限制了這些研究對理論的貢獻。在本研究中，我們將採取比較完整性的觀點，考慮所有社會資本的元素來發展研究模型，以探討社會資本中的各個元素如何影響買方(製造商)績效。此外，兩項關於供應商的關係特定投資所產生的資源能力：彈性及合作，也將納入研究模型，以探討它們對關係資本的影響。本研究將進行問卷調查以取得製造商觀點的樣本資料，並據以檢定本研究所設定模型中的各個研究假設。

中文關鍵詞：社會資本、認知資本、結構資本、關係資本、買方績效

英文摘要：The majority of research work that explore performance variation in buyer-supplier relations based on social capital theory only concentrate on relational dimension and/or structural dimension, which might limit their theoretical contributions. In this study, we take a more holistic view to develop a research model based on the social capital theory to investigate how social capital elements result in desired buyer (manufacturer) performance behind the supply chain integration strategy. In addition, we will also look into the effects of two resource capabilities, supplier flexibility and supplier collaboration, resulted from suppliers' relationship-specific investments on relational capital. A sample composed of manufacturing firms from different industries in Taiwan will be used to test the hypotheses in the proposed research model.

英文關鍵詞：Social Capital, Cognitive Capital, Structural Capital, Relational Capital, Buyer Performance

# **How Buyer Performance Is Influenced in the Supply Chain? A Social Capital Perspective**

## **ABSTRACT**

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The majority of research work that explore performance variation in buyer-supplier relations based on social capital theory only concentrate on relational dimension and/or structural dimension, which might limit their theoretical contributions. In this study, we take a more holistic view to develop a research model based on the social capital theory to investigate how social capital elements result in desired buyer (manufacturer) performance behind the supply chain integration strategy. In addition, we will also look into the effects of two resource capabilities, supplier flexibility and supplier collaboration, resulted from suppliers' relationship-specific investments on relational capital. A sample composed of manufacturing firms from different industries in Taiwan will be used to test the hypotheses in the proposed research model.

**Key Words:** *Social Capital, Cognitive Capital, Structural Capital, Relational Capital, Buyer Performance*

## 結案報告

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中文摘要

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大部分基於社會資本理論探討在買賣雙方關係中的績效差異性的研究，僅使用社會資本的關係資本或/及結構資本元素的影響性，這種做法限制了這些研究對理論的貢獻。在本研究中，我們將採取比較完整性的觀點，考慮所有社會資本的元素來發展研究模型，以探討社會資本中的各個元素如何影響買方(製造商)績效。此外，兩項關於供應商的關係特定投資所產生的資源能力：彈性及合作，也將納入研究模型，以探討它們對關係資本的影響。本研究將進行問卷調查以取得製造商觀點的樣本資料，並據以檢定本研究所設定模型中的各個研究假設。

**關鍵詞：**社會資本、認知資本、結構資本、關係資本、買方績效

## **1. Introduction**

Due to the ever increasing competition in the global business environment and the emerging globalization trend, in the past two decades, the research of supply chain management (SCM) has received lots of attention among academicians around the world and it has also been incorporated in the competitive strategy of many firms as a crucial element in industries to survive in the dynamic environment. One of the key elements in SCM is supply chain integration (SCI), which provides manufacturers important benefits such as reduced inventory costs, reduced manufacturing costs, escalated customer value and satisfaction, faster response to market environment changes, and improved product development and innovation. (Flynn, Huo and Zhao, 2010; Homburg and Stock, 2004; Koufteros, Vonderembse and Jayaram, 2005; Song and Di Benedetto, 2008) These benefits can be obtained through effective and efficient flows of products and services, information, and financial resources. (Flynn, Huo and Zhao, 2010)

Apparently the success of SCI requires intimate and cooperative relationships between supply chain members. But, what are drivers behind these virtuous relationships? Trust and commitment have been considered as important cornerstones of relationship development in the literature. (Morgan and Hunt, 1994; Kwon and Suh, 2004; Johnston, McCutcheon, Stuart and Kerwood, 2004; Shin, Collier and Wilson, 2000) However, trust and commitment are part of the elements to create relationships. They reflect the relational capital and represent only one single dimension of social capital in a supply network. Other factors not considered much in the literature such as reciprocity, shared goals, shared norms, strength of the ties, the position within the network and the extent of the network might also play roles in shaping good relationships.

According to Nahapiet and Ghoshal (1998), social capital is composed of three

elements: cognitive capital, structural capital and relational capital. Through a systematic literature review, Matthews and Marzec (2012) conclude that the majority of research papers that explore performance variation in buyer-supplier relations based on social capital theory only concentrate on relational dimension and/or structural dimension, which might limit their theoretical contributions. (Adler and Kwon, 2002; Cousins, Handfield, Lawson and Petersen, 2006; Krause, Handfield and Tyler, 2007; Ketchen and Hult, 2007; Lawson, Tyler and Cousins, 2008; Panayides and Venus Lun, 2009) To fulfill this literature gap, in this study we take a more holistic approach based on the social capital theory to research how social capital elements result in a buyer's performance behind the supply chain integration strategy. In particular, we specify our research scope within a business-to-business context to study how the perceived social capital of a manufacturer (customer) accrued from its strategic relationship with the major supplier (seller) influence its performance. In addition, we will also look into the effects of two capabilities, supplier flexibility and supplier collaboration, resulted from a supplier's relationship-specific investments on relational capital. In other words, we like to know whether the buyer-seller relations can be enhanced further by relationship-specific investments, which in turn leads to better buyer performance.

Based on the above arguments, we would like to address the following research questions:

- (1) Can structural capital and cognitive capital boost relational capital?
- (2) Can supplier flexibility and supplier collaboration escalate relational capital?
- (3) Can social capital as a whole result in better buyer performance?

To answer the above three research questions, a research model based on the social capital theory will be developed. The proposed research model will be empirically tested against a sample data composed of manufacturing firms who will

evaluate their relationships with their major suppliers according to the measurement tool developed in this study.

## **2. Literature Review**

### **2.1 Social Capital Theory**

The researchers in organizational area commonly note that social capital is a valuable asset that originates from access to resources generated from social relationships. (Granovetter, 1992) In this study, we will use this definition to argue that a manufacturer (buyer) can accumulate social capital resulted from social interactions with its key supplier (seller). Indeed, from the resource view, social capital represents available and valuable resources of an organization, which are accrued through social relations. The inter-organizational interactions are crucial elements of social relations. However, social capital builds more on the strength of weak ties than that of strong ties, because weak ties enable an organization to mobilize diversified resources that they or their similar partners don't have. (Matthew and Marzec, 2012) In the supply chain context, suppliers engage in materials or parts production that required different knowledge and capabilities from those of manufactures. Thus, we consider social interactions between suppliers and manufacturers are weak ties that can build up social capital.

Nahapiet and Ghoshal (1998) argued that social capital should contain three elements: cognitive capital, structural capital and relational capital. The cognitive capital is characterized by shared goals, norms, vision and values between members. (Tsai and Ghoshal, 1998) In other words, this social capital element generates common understanding and sense-making within the community. Thus, with cognitive capital members are able to make sense of and classify new information and knowledge. (Grant, 1996; Nonaka, 1994) In addition, the cognitive capital help

identify appropriate ways for members to coordinate their exchange and thinking processes. (Roden and Lawson, 2014) Since the cognitive capital provides members a positive psychological environment, researches have shown its positive linkage to positive and cooperative behavior. (Kostova and Roth, 2003; Ring and Van De Ven, 1992; Zaheer, McEvily and Perrone, 1998)

The structural capital indicates the network of relations as a whole. It includes the strength of the ties, the individual's position within the network and the scope of the network. Roden and Lawson (2014) operationalize structural capital as social interaction ties existing between buyers and sellers, which refers to the extent of arranged social processes and activities to coordinate. For example, buyers and sellers can arrange certain social events, organize workshops, or launch cross-functional teams. (Roden and Lawson, 2014) The social interaction ties facilitate information and resources flow within a community. The managerial and technical communication sharing based on these social interaction ties boosts buyers' performance improvement. (Lawson et al., 2008)

The relational capital contains assets generated from established relationships, which include trust, obligation and identification. Trust refers to the confidence of one party on reliability and integrity of an exchange partner and the belief that the partner will perform actions resulting in positives as well as not take unexpected actions resulting in negative outcomes. (Morgan and Hunt, 1994; Anderson and Narus, 1990) It can serve as a powerful control mechanism to reduce opportunistic behavior. (Adler and Kwon, 2002) Obligation is a commitment or duty for community members to take certain normative or reciprocal actions in the future. (Roden and Lawson, 2014) Identification represents the way that community members see themselves as one with another member or group of members. (Nahapiet and Ghoshal, 1998)

Matthews and Marzec (2012) argue that the main function of social capital theory



can provide insights into gaining access to valuable resources through social relations as well as serve as a control mechanism that explains how communities behave. They further indicate that the majority of papers that explore performance variation in buyer-supplier relations based on social capital theory only concentrate on relational dimension and/or structural dimension, which might limit their theoretical contributions. Hence, to obtain a more complete picture, in this paper we will investigate the effects of all three social capital elements on buyers' performance. Before adopting a holistic approach, we need to first clarify the relationships among the three social capital elements.

Since cognitive capital is involved with consensus on common goals, norms and values, and structural capital is involved with social ties, they together provide infrastructure and building blocks for relational capital that result in strategic buyer-supplier relationships. (Nahapiet and Ghoshal, 1998; Carey, Lawson and Krause, 2011; Roden and Lawson, 2014) In a community environment where common goals, values and norms are well-implemented to reduce the risk of free-riding, mutual trust, reciprocity and obligation can then be developed. (Coleman, 1990; Nahapiet and Ghoshal, 1998) Adler and Kwon (2000) also indicate that it is unlikely for relational capital to exist without mutual understanding of one another in a community. When common cognitions exist, buyers and suppliers tend to more trust one another, expect reciprocity from other parties, and work toward shared goals. (Tsay and Ghoshal, 1998; Carey, et al., 2011) On the other hand, Carey et al. (2011) argue that arranged social events and team building exercises make mutual evaluation on trustworthiness possible; thus, behavioral transparency can be expected, free-riding can be reduced and information asymmetries can be avoided. Bell, Oppenheimer and Bastien (2002) and Granovetter (1985) also provide evidence that trust between organizations can be developed through direct interactive experiences. Based on the

above arguments, we set the following two hypotheses:

***H<sub>1</sub>: Cognitive capital positively influences relational capital.***

***H<sub>2</sub>: Structural capital positively influences relational capital.***

## **2.2 Supplier Flexibility and Supplier Collaboration**

In transaction cost economics theory, relationship-specific assets (physical and human resources) are considered risky because their value either decrease or even vanish if the relationship terminates. However, why members in a business relation still desire to make such relationship-specific investments? Exchange partners tend to sacrifice short-term losses for long-term gains, if they are pursuing a long-term relationships. (Heide and Miner, 1992) Kwon (2011) provides empirical evidence that when suppliers have confidence on a long-term relationship with their buyer, they are more willing to invest in joint problem solving, timely and reliable delivery, as well as a flexible response to requests and emergencies. (Kwon, 2011) To build up close and successful business relationships, relationship-specific investments made by partners can strengthen mutual orientation, interdependence, and solidarity. (Johanson and Mattson, 1987; Murry and Kotabe, 2005; Kwon, 2011)

In this study, instead of including relationship-specific adaptation explicitly in the research model, we consider two important resource capabilities, flexibility and collaboration, resulted from relationship-specific investments made buy suppliers to explore their effects on relational capital accrual. Flexibility can be defined as a behavioral element or capability of suppliers with which to respond effectively and efficiently to unanticipated sudden changing needs or special requests from customers (Bowersox, Daugherty, Dröge, Rogers and Wardlow 1989). Business environments are changing dynamically and in a fast-than-ever step. Because of the globalization trend, the global materials supply market has become very competitive, outperforming suppliers should demonstrate flexibility in adapting to changes or requests from

customers to acquire their trust, commitment and reciprocity. In this sense, flexibility can be regarded as a source of relational capital.

To collaborate with customers closely to maintain relationships, suppliers are more willing to share operations related information with customers, fulfill their promises to customers and adapt to changing needs from customers. Collaboration has been emphasized in supply chain management literature as a key factor to successful supply relationships. Collaboration can be regarded as a core and relational capability of a supplier to generate relational capital for customers. Because close collaboration with customers is likely to fully meet their requirements, such as changing needs or special requests in service requirements. Based on the reciprocal mindsets, customers are likely to generate feelings of obligation and are more likely to give repeat business to suppliers. Thus, the relationships can be maintained and enhanced to guarantee long-term competitive advantage (Artz, 1999). Through close collaboration with customers, suppliers know more and better about emergent needs and special requests from customers, and thus can make more effective relationship-specific investments to benefit customers (Brewer and Speh, 2000; Sabath and Fontanella, 2002; Wong and Karia, 2010).

The capability of being flexible makes a supplier more attractive to customers. The markets faced by customers are competitive and market needs could be volatile. To deal with uncertainties in demands, firms rely very much on their suppliers who can be flexible to respond to sudden changes in needs and/or special material specification requests. On one hand, if suppliers can flexibly adapt themselves to customers' needs, customers will likely be more confident on their capabilities and believe that suppliers want to take actions that favor them; hence suppliers can expect more trust from their customers (Han, Sung and Shim 2014). On the other hand, when customers perceive the flexibility of their suppliers to be helpful, they usually will not

take risky actions to jeopardize the relationship. And, they should be desired to maintain the relationship as possible as they can; otherwise, they will incur high switching costs to find other competent suppliers.

Collaboration plays an important role in facilitating other capabilities such as flexibility. If suppliers engage in effective collaboration with their customers in forecasting, planning and arranging material requirements in an optimal manner, customers are more able to plan and implement their routine and non-routine demands in production operations efficiently. Through intensive and transparent collaborations and communications, customers shall get to know their suppliers better about the corporate culture, processes, attitude toward the relationship. This will lead to a high trust level in the long run. The collaborative behaviors will impel both suppliers and customers to emphasize on maintaining a productive exchange and do all they can to maintain the relationship (Artz 1999; Wong and Karia 2010). Based on the above arguments, we make the hypotheses below:

***H<sub>3</sub>: Supplier flexibility positively affects relational capital.***

***H<sub>4</sub>: Supplier collaboration positively affects relational capital.***

### **2.3 Buyer Performance**

As a buyer of materials from suppliers and a seller of products to customers, manufacturers are concerned about their production and procurement operations related performance, which is referred to buyer performance in this study. In the operations management and supply chain management literature, researchers have developed commonly acceptable performance indices for manufacturers as product providers, which include cost, quality, delivery, flexibility and innovation. (Ward, McCreery, Ritzman and Sharma, 1998; Krause et al., 2001) These performance indices reflect competitive priorities in the market and are sources of competitive

advantages for manufacturers in their product markets.

Manufacturers tend to reasonably reduce costs of materials purchased from their supplier in order to be price competitive and obtain satisfactory returns. Part of the achievement on lowering cost efforts made by suppliers may transfer to their buyers in the form of lower buying prices. (Clark, 1989; Turnbull, Oliver and Wilkinson, 1992; Human and Provan, 1997) The quality of input materials from suppliers has great effects on production performance and product function for manufacturers. Quality has been considered as an order qualifier in industries; the inappropriate quality assurance may result in quality problems and production delays for manufacturers. (Human and Provan, 1997; Liker and Wu, 2000)

Aggressively pursuing lower inventory goals with just-in-time mindsets, manufacturers tend to rely on their reliable on-time delivery practices and this might be related to the delivery performance of ordered materials from their suppliers. Krause et al. (2007) indicate that reliability of delivery and delivery speed together shape delivery performance. To respond to fast and unpredictable market changes, manufacturers should maintain flexible operations. Manufacturing flexibility partly relies on suppliers' quality, delivery time, reliability, and flexibility. (Krause et al., 2007)

In addition to cost improvement, innovation improvement is another crucial competitive priority for manufacturers. (Ward et al., 1998; Krause et al., 2001) They need to have innovation improvement in product design to satisfy more and more demanding customers and process design to make products in a more efficient while lower cost manner. The involvement of suppliers in product and process innovation is crucial for manufacturers' innovation performance through collaborative relationships. (Petersen, Handfield and Ragatz, 2005; Lawson et al., 2008)

In this study, we will examine the influence of buyer performance from the

relational aspect in a more holistic way, especially relationships between manufacturers and suppliers based on accrued social capital. Cognitive capital is characterized by shared goals and culture, which are present when members within a relation share a common understanding and approach to performing tasks within the network. (Tsai and Ghoshal, 1998; Inkpen and Tsang, 2005) Through the experiences of continued interactions, shared goals and values between buyers and their key suppliers are firmly embedded, which result in a self-reinforcing process that benefits sense-making in participation activities within the network. (Weick, 1995) This self-reinforcing process of cooperative cognitive sense making can lead to buyer performance improvement. (Krause et al., 2007) Hult, Ketchen and Slater (2004) provide empirical evidences that complementary cognitions of shared goals and culture can be linked to performance improvements in buyer-seller relationships. Shared goals such as best serving the end market while pursuing benefits of the supply chain as a whole may motivate cooperation and collaboration of suppliers to improve cost, quality, delivery, flexibility and innovation for buyers. On the contrary, incongruent goals and values between members within a relation will generate misunderstanding and conflicts, which undermine the relation and go against buyer performance improvement. Hence, we set the following hypothesis:

***H<sub>5</sub>: Cognitive capital positively influences buyer performance.***

Structural capital is involved with the network of relations as a whole and is reflected by social interaction ties. Social interaction ties facilitate information and resources flow within a network. In this study, we follow Roden and Lawson's (2014) definition to operationalize structural capital as social interaction ties that exist between buyers and sellers.

Social interaction ties refer to the extent of arranged social processes and

activities to coordinate. For example, buyers and sellers can arrange certain social events, organize workshops, or launch cross-functional teams. (Carey et al., 2011; Roden and Lawson, 2014) Through these interaction activities, suppliers and buyers can share crucial information and knowledge to improve their operations. (Uzzi, 1997; Dyer and Nobeoka, 2000) For example, suppliers may obtain technical support in their production process and quality assurance, production plan and inventory information, shared end market information from buyers. Cousins et al. (2006) and Kale et al. (2000) provide empirical evidences that social interaction ties can influence performance improvements and value creation in buyer-supplier relationships through shared information and access to valuable resources. Hence, buyers are able to share suppliers' information about capacity, inventory quality, and logistics. Based on the exchanged information and knowledge, both parties can make improvement in their operations; thus, buyers' performance on cost, quality, delivery, flexibility and innovation can be enhanced accordingly. (McEvily and Marcus, 2005; Moran, 2005) Based on the above argument, we make the following hypothesis:

***H<sub>6</sub>: Structural capital positively influences buyer performance.***

Relational capital is composed of assets created by established relationships, which include trust, obligation and identification. Through continuous interaction experiences, buyers and sellers more and more understand their common goals, value and norms that can benefit them as a whole. Thus, trust and commitment can be expected in the relation. Relational capital can effectively discourage opportunistic behavior, increase the confidence, and decrease transaction costs in established buyer-seller relationships. (Dyer and Singh, 1998) Both parties feel obligated to make adjustments or work with the other parties to boost joint performance by removing barriers and inefficiencies. (Cousins et al., 2006). Artz (1999) empirically proves that

the relational norms of collaboration and commitment result in higher buyer–supplier performance while Kotabe et al. (2003) provide empirical evidence that better supplier relationships lead to increased buyer performance in product design, process design, lead time and quality.

In established relationships, relational capital can generate a store of trust, goodwill and reciprocity for future use. They can be directed to generated benefits such as lower costs, greater capacity for innovation, and shortened time to market for new products. (Carey et al., 2011) With relational capital, buyers and sellers can more effectively combine knowledge that could only be shared in established relations to lower operating and product costs, obtain insights into new technology opportunities, shorten time to market for new products, and improve product and process design. (Corsten and Felde, 2005; Cousins et al., 2006; Handfield, Ragatz, Petersen, Monczka, 1999). Based on the above arguments, we set the a hypothesis below:

***H<sub>7</sub>: Relational capital positively influences buyer performance.***

## **2.4 Conceptual Model**

Based on the social capital theory, we take a more holistic view to develop a research model that examines the effects on buyer performance of all three social capital elements: cognitive capital, structural capital, and relational capital. We also take supplier flexibility and supplier collaboration capabilities into account as two additional antecedent factors to relational capital. These two important elements are the results of relationship-specific investments made by suppliers. Though risky, they play roles in consolidate relations and, in turn, generate performance for buyers and suppliers as a whole. By applying the proposed model, suppliers learn that how to make proper relationship-specific adjustments to benefit accumulation of social capital, which in turn benefits customers in performance improvement, results in



customer loyalty, and wins repeated business in the long run. Through the review of relevant research literature in the previous section, we have made seven research hypotheses which will be tested with a surveyed sample. The proposed research model is depicted in Figure 1 below.

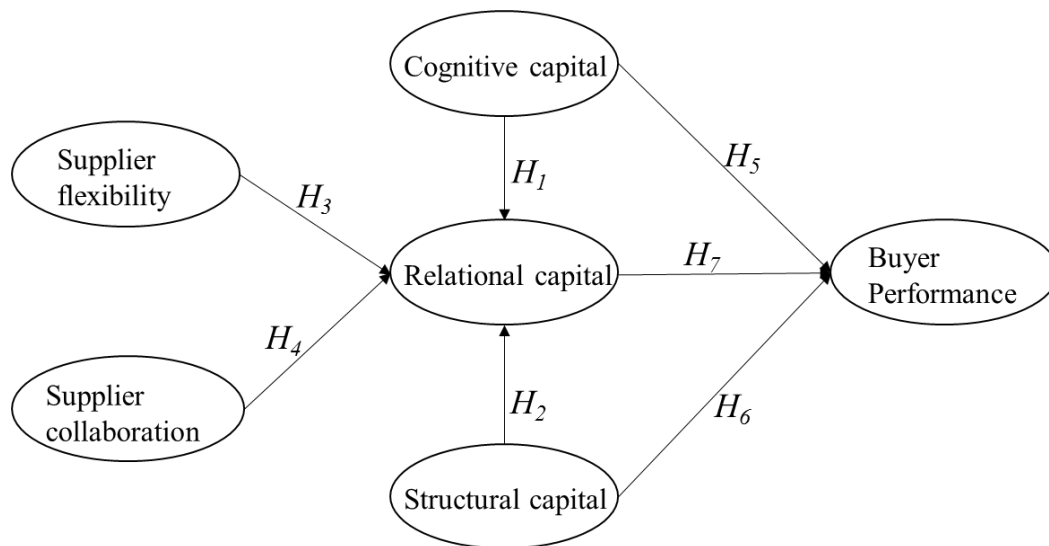


Figure 1. Research Framework

### 3. Research Methodology

#### 3.1 Measurement

Multiple items for each research construct are adapted from measurement scales empirically validated in the literature to measure research constructs in the proposed model. All items used in the questionnaire instrument are seven-point Likert scales anchored by “strongly disagree” and “strongly agree”. The four items used for measuring cognitive capital adapted from scales empirically tested by Carey et al. (2011) and Roden and Lawson (2014). Questionnaire respondents, managers who interact with their suppliers intensively, are asked to answer the following four question items based on the evaluations on their relationships with the key supplier: (1)

Both parties often agree on what is in the best interest of the relationship; (2) Both parties share the same business values; (3) This supplier does not share our goals for this business (reversed); and (4) We share the same ambitions and vision.

Following Tsai and Ghoshal (1998) and Carey et al. (2011), we use social interaction ties as a proxy for structural capital. A five-item scale empirically tested by Cousins et al. (2006), Cousins and Menguc (2006), Carey et al. (2011) and Roden and Lawson (2014) are used to measure the extent to which the buyer and the supplier engage in social interaction. Questionnaire respondents are asked to answer to what extent they engage in the following five types of activities with the key supplier: (1) organized social events; (2) joint workshops; (3) cross-functional teams; (4) co-location; and (5) team building exercises.

Relational capital is measured by a five-item scale adapted from scales validated by Carey et al. (2011), Roden and Lawson (2014) and Lawson et al. (2008). This five-item scale was developed by Kale et al. (2000) according to the earlier work of Dyer and Singh (1998) and Madhok (1995). Respondents are asked to answer the following five questions according to their evaluation on the relationships with the key supplier: (1) The relationship is characterized by close interaction at multiple levels; (2) The relationship is characterized by mutual trust at multiple levels; (3) The relationship is characterized by mutual respect at multiple levels; (4) The relationship is characterized by mutual friendship at multiple levels; and (5) The relationship is characterized by high levels of reciprocity.

Flexibility is measured by four items of Hartmann and de GrahL's scale (2011), which was adapted from the studies of Noordewier, John and Neviv (1990), Cannon and Homburg (2001). Respondents are required to answer the following questions based on their evaluations on the key supplier: (1) The key supplier is flexible in response to requests we make; (2) The key supplier flexibly handles unanticipated

problems; (3) The key supplier handles sudden changes of orders well; and (4) The key supplier readily adapts to unforeseen changes of orders.

Collaboration is measured by four items adapted from Sinkovics and Roath's (2004) scale. Respondents are asked to answer the following questions based on their evaluations on the key supplier: (1) The key supplier exploits possibilities to improve inter-organizational processes with us; (2) The key supplier and our firm can find synergistic ways to cooperate; (3) The key supplier works together to help us with product and process innovation; and (4) The key supplier and our firm continuously share proprietary information mutually.

The scale for buyer performance contains eight items adapted from scales developed and validated by Kotabe et al. (2003), Krause et al. (2007), Carey et al. (2011) and Lawson et al. (2008). Respondents are asked to answer the following questions according to their evaluations on their firms: (1) In the last 2–3 years, we have been able to improve product design performance through the relationship; (2) In the last 2–3 years, we have been able to improve process design performance through the relationship; (3) In the last 2–3 years, we have been able to improve our product quality through the relationship; (4) In the last 2–3 years, we have been able to improve our ability to innovate through the relationship; (5) In the last 2–3 years, we have been able to improve our manufacturing flexibility through the relationship; (6) In the last 2–3 years, we have been able to shorten our new product development cycle times through the relationship; (7) In the last 2–3 years, we have been able to achieve total cost reductions through the relationship; and (8) In the last 2–3 years, we have been able to lower product cost through the relationship.

### **3.2 Data Collection**

The empirical analysis in this study is to examine the hypothesized relationships of constructs in a research model based on the social capital theory in a buyer-seller

inter-organizational context from buyers' perspective. In order to obtain a sample data for the empirical test, 20 EMBA students from a national university in northern Taiwan were recruited to help the questionnaire survey process. Each EMBA student was asked to contact four of their friends who have been in charge of procurement activities in their companies to answer the questionnaire. 80 copies of questionnaire were distributed, 61 of them were valid for analysis.

To assure the content validity of measurement, we developed the questionnaire on the following basis: (1) all measurement scales were adapted from existing scales in the germane literature; (2) all measurements were translated into Chinese, which is a language comprehensible to virtually all Taiwanese. To secure conceptual equivalence, the original 30 question items were modified based on our research context and translated into Chinese by the authors who have been educated in the USA university system for more than five years, and were translated back into English by bilingual people who were blind to the original English version. The comparison was made with the original version in terms of general meaning of the sentences, complexity levels, forms, semantic similarity of words. Corrections were made for the differences to confirm the consistency between the two language versions of question items. The reliability and validity of the measurement scales were also checked carefully in this study.

The survey questionnaire begins with the background information about the company of a respondent. We also ask the respondent to identify a strategic supplier that he or her company has been worked with for some years and evaluate accordingly the perceived social capital accumulated through the relationship, flexibility and collaboration of the supplier, and his or her company's performance improvement in various aspects due to the relationship.

The sample profile analysis is summarized in Table 1 below. From Table 1, we

can see that most of the companies investigated are in the information & electronics industry (45.9%), followed by the metal machinery industry (24.59%), the chemical industry (14.75%), and the commodity industry (14.75%). More than half of the companies are small and medium enterprises with registered capital less than \$30 million (22.95%), between \$30 million and \$100 million (9.84%), and between \$100 million and \$1 billion (34.43%). Most of the companies have less than 500 employees (62.30%), which is consistent with the phenomenon in the entire national industry structure. The companies with revenue from last year fall between \$100 million and \$1 billion (37.7%), and greater than \$1 billion (37.7%), account for more than half of all investigated companies, followed by the companies have last year revenue between \$10 million and \$50 million (14.5%), between \$50 million and \$100 million (4.92%), and less than \$10 million (4.92%).

**Table 1. Profile analysis of the investigated sample**

Variable	Frequency	Variable	Frequency
<i>Industry</i>		<i>Capital(NT\$)</i>	
Commodity industry	9 (14.75%)	<30 million	14 (22.95%)
Chemical industry	9 (14.75%)	30-100 million	6 (9.84%)
Metal machinery industry	15 (24.59%)	100 million - 1 billion	21 (34.43%)
Information & electronics industry	28 (45.90%)	> 1billion	20 (32.79%)
<i>Number of employees</i>		<i>Revenue last year (NT\$)</i>	
500	38 (62.30%)	< 10 million	3 (4.92%)
501 - 1500	10 (16.39%)	10 - 50 million	9 (14.75%)
1501 - 2500	3 (4.92%)	50 - 100 million	3 (4.92%)
2501 - 3500	3 (4.92%)	100 million - 1 billion	23 (37.70%)
> 3500	4 (6.56%)	> 1 billion	23 (37.70%)
na	3 (4.92%)		

Note:  $n=61$ , NT\$: new Taiwan dollars

## 4. Results

### 4.1 Reliability and Validity Analysis

The Cronbach  $\alpha$  coefficients shown in Table 2 below are all well above 0.7 (ranging from 0.806 to 0.950), indicating a good reliability of the measurement scales (Nunnally, 1978). Exploratory factor analysis was conducted to obtain factor loading values of all question items on the construct they intend to measure. In addition, the construct composite reliabilities based on standardized factor loadings are well above 0.6 (ranging from 0.885 to 0.958), confirming a well-accepted reliability of the scales (Bagozzi and Yi, 1988; Fornell and Larcker, 1981). In table 3, the factor loadings of each construct are all well 0.6, further evidencing the consistencies of measured items for each construct and showing convergent validity of the construct measurement scales (Bagozzi and Yi, 1988).

The last column of Table 2 presents the average variance extracted (AVE) values. One can easily see that AVEs for all scales are higher than 0.5, demonstrating a high degree of reliability and convergent validity, i.e., the variance captured by the construct was greater than the variance due to measurement error (Fornell and Larcker, 1981). From Table 3 below we can learn that the square roots of the AVE values are greater than the off-diagonal inter-construct correlations in the corresponding rows and columns, which support the claim of discriminant validity of measurement scales and suggest that all constructs in the proposed model are appropriate.

**Table 2. Summary measures of the factor analysis (n=61)**

Construct	Item	Average	Factor loading	Cronbach's $\alpha$	Composite reliability (CR)	Average variance extracted (AVE)
Cognitive Cap. (COG)	COG1	5.48	0.83	<b>0.806</b>	0.885	0.720
	COG 2	5.21	0.89			
	COG 3*	4.16				
	COG 4	5.39	0.82			
Structural Cap. (STRU)	STRU1	3.15	0.73	<b>0.893</b>	0.921	0.700
	STRU 2	4.20	0.86			
	STRU 3	4.70	0.83			
	STRU 4	3.70	0.86			
	STRU5	4.15	0.89			
Relational Cap. (REL)	REL1	5.46	0.73	<b>0.856</b>	0.900	0.646
	REL2	5.52	0.86			
	REL 3	5.82	0.85			
	REL 4	5.72	0.86			
	REL5	5.57	0.71			
Flexibility (FLEX)	FLEX 1	5.89	0.71	<b>0.877</b>	0.914	0.729
	FLEX 2	5.39	0.90			
	FLEX 3	5.33	0.89			
	FLEX4	5.20	0.91			
Collaboration (COLL)	COLL 1	5.31	0.88	<b>0.853</b>	0.919	0.740
	COLL 2	5.41	0.92			
	COLL 3	5.48	0.87			
	COLL 4	4.79	0.76			
Performance (PERF)	PERF 1	5.10	0.88	<b>0.950</b>	0.958	0.742
	PERF 2	5.18	0.90			
	PERF 3	5.41	0.91			
	PERF 4	4.97	0.91			
	PERF5	5.10	0.86			
	PERF6	4.90	0.88			
	PERF7	5.13	0.77			
	PERF8	5.18	0.77			

\*Deleted item that increase construct reliability significantly

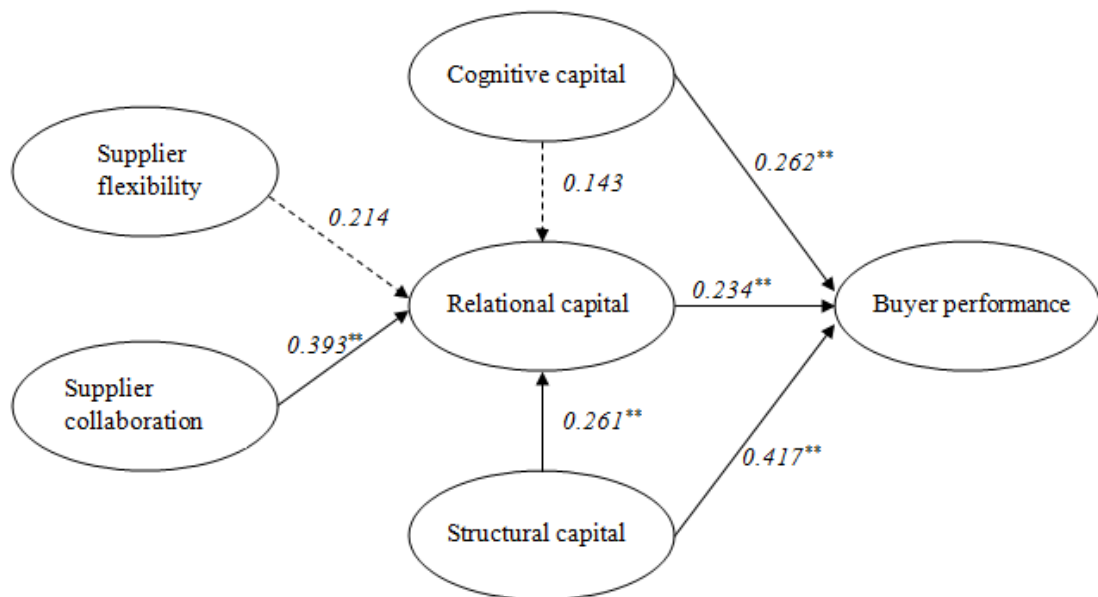
**Table 3. Correlations between constructs and square roots of AVEs**

	COG	STRU	REL	FLEX	COLL	PERF
COG	<b>0.848</b>					
STRU	0.324	<b>0.838</b>				
REL	0.496	0.516	<b>0.804</b>			
FLEX	0.386	0.143	0.515	<b>0.855</b>		
COLL	0.509	0.453	0.693	0.541	<b>0.860</b>	
PERF	0.512	0.615	0.574	0.477	0.681	<b>0.862</b>

Note: Diagonal elements are square roots of AVEs

#### 4.2 PLS-SEM Inner Model Estimation and Hypothesis Testing

The structural model in PLS\_SEM analysis dealing with the relationships among the exogenous variables and the endogenous variables provides the basis for testing the research model in this study. Figure 2 below shows the estimated path coefficients of the structural model.



Note: \*\* p-value < 0.05; dashed-line: non-significant path

**Figure 2. Estimates of the PLS Model**



$H_1$  and  $H_2$  address the relationships among the three social capital elements.  $H_1$  (the effect of cognitive capital on relational capital) is not supported. Though cognitive capital cannot lift relational capital, it can still significantly influence buyer performance. The support of  $H_2$  suggests that structural capital can positively influence relational capital ( $\gamma=.261$ ,  $t=2.72$ , and  $p<.05$ ).  $H_3$  and  $H_4$  are about the effects of supplier flexibility on relational capital and of supplier collaboration.  $H_3$  is not supported by the sample data, indicating that supplier flexibility may not be a key factor to relational capital. However, the support of  $H_4$  indicates that relational capital can be effectively affected by supplier collaboration ( $\gamma=.393$ ,  $t=3.23$ , and  $p<.05$ ).  $H_5$  ~  $H_7$  deal with the effects of the three social capital elements on buyer performance. All three hypotheses are supported by the sample data. The support of  $H_5$  confirms that cognitive capital significantly influences buyer performance ( $\beta=.262$ ,  $t=2.29$ , and  $p<.05$ ). The support of  $H_6$  assures that structural capital significantly affects buyer performance ( $\beta=.417$ ,  $t=3.81$ , and  $p<.05$ ). And,  $H_7$  is also supported ( $\beta=.234$ ,  $t=1.97$ , and  $p<.05$ ), indicating that relational capital can significantly benefit buyer performance.

## **5. Conclusions**

The purpose of this study is to examine the effects of social capital elements on buyer performance. Based on the social capital theory, the inter-relationships among the three social capital elements were established. Two additional factors, supplier flexibility and supplier collaboration, were included in the research model for their potential influences on relational capital. A sample data of Taiwanese manufacturers were obtained through a questionnaire survey. The reliability and validity of measurement scales were carefully examined before a structural equations model analysis was conducted. The hypothesis testing based on the SEM analysis results

showed that structural capital and supplier collaboration can significantly enhance relational capital while cognitive capital and supplier flexibility have no significant effects on relational capital. The results also showed that all three social capital elements can significantly benefit buyer performance.

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107年度專題研究計畫成果彙整表

計畫主持人：周世玉		計畫編號：107-2410-H-003-029-				
計畫名稱：從社會資本的觀點探討供應鏈買方績效的影響原因						
成果項目		量化	單位	質化 (說明：各成果項目請附佐證資料或細項說明，如期刊名稱、年份、卷期、起訖頁數、證號...等)		
國內	學術性論文	期刊論文	0	篇	"How buyer performance is influenced in a supply chain? A social capital perspective" (paper ID "ESSHBS-19-755"), 9th International Conference On Advances In Economics, Social Science and Human Behavior Study - ESSHBS 2019, London	
		研討會論文	1			
		專書	0			本
		專書論文	0			章
		技術報告	0			篇
		其他	0			篇
	智慧財產權及成果	專利權	發明專利	申請中	0	件
			已獲得	0		
			新型/設計專利	0		
		商標權	0			
		營業秘密	0			
		積體電路電路布局權	0			
		著作權	0			
		品種權	0			
		其他	0			
	技術移轉	件數	0	件		
		收入	0	千元		
	國外	學術性論文	期刊論文	0	篇	
研討會論文			0			
專書			0	本		
專書論文			0	章		
技術報告			0	篇		
其他			0	篇		
智慧財產權及成果		專利權	發明專利	申請中	0	件
			已獲得	0		
			新型/設計專利	0		
		商標權	0			
		營業秘密	0			

		積體電路電路布局權	0		
		著作權	0		
		品種權	0		
		其他	0		
	技術移轉	件數	0	件	
		收入	0	千元	
參與計畫人力	本國籍	大專生	0	人次	協助整理調查資料並建檔，協助計畫經費報帳庶務。
		碩士生	2		
		博士生	0		
		博士級研究人員	0		
		專任人員	0		
	非本國籍	大專生	0		
		碩士生	0		
		博士生	0		
		博士級研究人員	0		
		專任人員	0		
其他成果 (無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。)					

# 科技部補助專題研究計畫成果自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現（簡要敘述成果是否具有政策應用參考價值及具影響公共利益之重大發現）或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

達成目標

未達成目標（請說明，以100字為限）

實驗失敗

因故實驗中斷

其他原因

說明：

2. 研究成果在學術期刊發表或申請專利等情形（請於其他欄註明專利及技轉之證號、合約、申請及洽談等詳細資訊）

論文： 已發表  未發表之文稿  撰寫中  無

專利： 已獲得  申請中  無

技轉： 已技轉  洽談中  無

其他：（以200字為限）

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性，以500字為限）

本研究基於社會資本理論，建構社會資本三要素對買方績效影響的模式，並融入資源基礎論的想法，將供應商彈性與供應商協同合作能力納入模式，以實際調查的樣本資料驗證供應商與買方關係所累積的認知資本，結構資本，與關係資本，如何與供應商彈性與協同合作能力等兩項資源因素如何對買方的產品發展與製程改善的績效造成影響。研究成果可應用於製造業廠商追求與供應商長期策略性合作的關係發展應用方面。

4. 主要發現

本研究具有政策應用參考價值： 否  是，建議提供機關

（勾選「是」者，請列舉建議可提供施政參考之業務主管機關）

本研究具影響公共利益之重大發現： 否  是

說明：（以150字為限）