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Antecedents and consequences of corporate diversification

A dynamic capabilities perspective

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Abstract

Purpose – The main purpose of this paper is to introduce a comprehensive model explaining what affects the scope of the firm and also to find out its impact on firm performance.

Design/methodology/approach – This paper is based on an empirical analysis of a sample of 312 hardware manufacturing companies in Taiwan.

Findings – The research findings indicate that capability exploitation and upgrading will exert a positive influence on corporate diversification. In addition, corporate diversification will exhibit a curvilinear effect on firm performance.

Practical implications – Under the logic of capability-based growth, managers should manage portfolios of capability upgrading and capability exploitation; and then, managers have to conduct econometric analyses to find out a firm's optimal level of corporate diversification for performance maximization.

Originality/value – This study attempts to propose a dynamic capabilities perspective, which suggests that the successful growth of a firm hinges on a strategic logic of capability-based growth management containing both capability exploitation and capability upgrading, for exploring the antecedents and consequences of corporate diversification.

Keywords Dynamic capabilities, Corporate diversification, Firm performance, Diversification, Corporate strategy, Organizations, Business development, Taiwan

Paper type Research paper

1. Introduction

What affects the scope of the firm is essential in the field of strategic management (Rumelt *et al.*, 1994), and also appears to be critical for firm performance. Numerous researchers have approached this inquiry by investigating corporate diversification and its impact on firm performance (Kim *et al.*, 1993; Singh *et al.*, 2010; Wan and Hoskisson, 2003; Wiersema and Bowen, 2008). Theoretically, the effect of corporate diversification on firm performance has been widely studied in the strategic management literature over the past decades (Delios and Beamish, 1999; Geringer *et al.*, 2000; Hoskisson and Hitt, 1990; Rumelt, 1974, 1982; Wan and Hoskisson, 2003). Despite diversification-performance studies provide mixed results (Datta *et al.*, 1991; Palich

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et al., 2000), clear consensus exists regarding that diversified firm gain significant performance from using synergistic management between businesses within its portfolio (Lang and Stulz, 1994). For example, Hitt *et al.* (1997) indicate that firms can achieve synergies by an integration of product and international diversification. Similarly, Kim *et al.* (1989) also find that a combination of related-product as well as international diversification strategy helps the firm to achieve profit stability. Furthermore, Kim *et al.* (1993) found that a favorable risk-return performance can be achieved with corporate diversification. Thus, critical to the attainment of synergy between product and international diversification lies in the firm's knowledge of how to best manage corporate diversification in a synergistic manner.

Despite the proliferation of studies on diversification-performance research, previous studies have largely ignored the more fundamental question about what drives the degree of a firm's corporate diversification (Colpan and Hikino, 2005; Hoskisson and Hitt, 1990). In order to complete this imperfection, a number of studies have begun to explore antecedents of corporate diversification (e.g., Døving and Gooderham, 2008; Shackman, 2007; Wiersema and Bowen, 2008). However, these investigations fail to take into account differential capability development as antecedents of corporate diversification (Døving and Gooderham, 2008). As Hoskisson and Hitt (1990) report, there remains much work before definitive conclusions are possible either in regard to the antecedents or the performance implications of diversification. In this respect, researchers draw academic attention to the importance of probing into the antecedents and consequences of corporate diversification. The principal objective of the study here is to fill this research gap.

In order to accomplish the research objective, this study attempts to propose a dynamic capabilities perspective which suggests that the successful growth of a firm hinges on a strategic logic of capability-based management containing both capability exploitation and capability upgrading, for exploring the antecedents and consequences of corporate diversification. Most of prior diversification researches focus research attention on product diversification (Bowen and Wiersema, 2005; Døving and Gooderham, 2008), international diversification (Gaur and Kumar, 2009; Herrmann and Datta, 2005; Lu and Beamish, 2004), or both (Balabanis, 2001; Geringer *et al.*, 2000; Wiersema and Bowen, 2008). However, unlike diversification through product and geographic dimension, firms diversifying through vertical and horizontal dimension receive lesser attention in strategic management research (Hutzschenreuter and Gröne, 2009; Teece, 1982).

The aim of this paper is to advance in the knowledge of the antecedents and consequences of corporate diversification. This study contributes to the corporate diversification literature by distinguishing between types of diversification, most notable between vertical diversification and horizontal diversification. First, vertical diversification refers to the integration of further steps along the process of product development. As Harrigan (1985) indicates, vertical diversification can help a firm achieve efficiencies through the relatedness of businesses along the value chain. Accordingly, vertical diversification may reflect firm scope of operations (Chiu and Liaw, 2009). Such vertical diversification implies that synergy can be realized across business units through economies of scope or the sharing of resources and capabilities across businesses (Hoskisson, 1987).

Second, horizontal diversification refers to the development of new products or product lines to realize additional businesses from current customers. This type of diversification is attributable to the recognition of the indivisibility of existing resources, realization of economies of scope, or simply static synergy (Teece, 1982). Substantive progress is achievable in the empirical realm once researchers are able to develop a more theoretically sound framework concerning the motives of choice made for different corporate diversification and its performance implication. Thus, focusing on high-tech firms within contractual manufacturing context, this study explores the antecedents and consequences of corporate diversification. The conceptual framework of this study in Figure 1 builds from this foundation.

The remainder of this paper is organized as follows. After the introduction, this paper provides the theoretical background and develops hypotheses concerning the antecedents and consequences of corporate diversification based on dynamic capabilities perspective in Section 2. Section 3 describes test hypotheses and an empirical investigation focusing on the validity of such corporate diversification for high-tech firms. This study is based on operating and financial data of 312 high-tech firms from 1998 to 2006. This paper concludes with a discussion of empirical findings and implications for future research opportunities on corporate diversification strategy.

2. Theoretical background

2.1 Antecedents of the scope of the firm

During the past two decades, the choice of business scope has become a primary strategic issue. A dominant figure in this research development is transaction cost economics (TCE). TCE focuses on the optimum level of internalization of transactions versus contracting via the market (Coase, 1937; Williamson, 1975, 1991). Markets and hierarchies are alternatives for structuring and conducting transactions. Firms continuously balance market coordination costs with bureaucratic control costs. The implications for strategy are that managers, transaction partners in particular, are bounded rational, risk averse, and opportunistic. The strategic task of managers is to focus on relative coordination costs of transacting inside versus outside the firm.

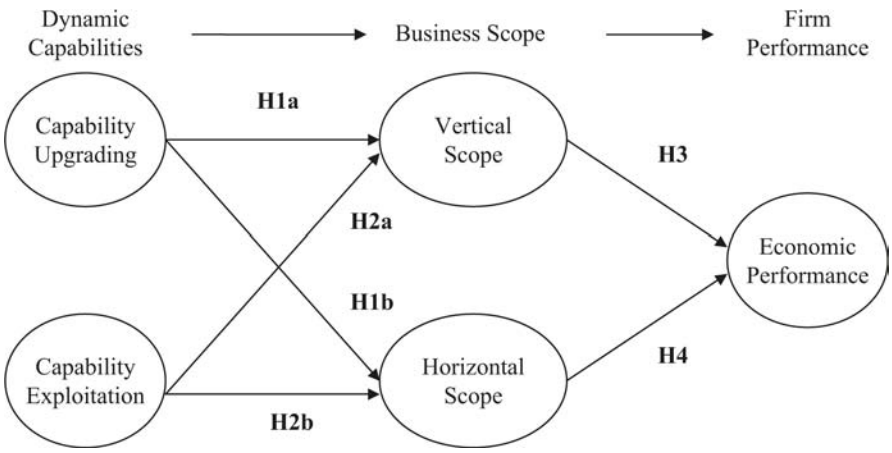

Figure 1.
Research framework

Widespread challenges and criticism confront this primary theoretical thinking. For instance, scholars of knowledge-based view of the firm argue that the relationship between asset specificity and boundary choice has little linkage with opportunism and market failure (Poppo and Zenger, 1998). This argument, in essence, is that, the more firm specificity of activities increases, the more efficiency of coordination may be enhanced through internal governance (Grant, 1996a; Kogut and Zander, 1992; Moran and Ghoshal, 1996). Consequently, scholars pay their attention to study the efficiency aspect of contracts. This is different from the traditional view of transaction costs in TCE, which holds that minimizing the cost of governance is the only goal.

In addition to the challenge from knowledge-based views of the firm, a theoretical convergence between TCE and a resource-based view of the firm has recently emerged (Jacobides and Hitt, 2005; Jacobides and Winter, 2005). Taking mortgage banking in the USA and the Swiss watch-manufacturing industry as an illustration, Jacobides and Winter (2005) do find that transaction costs and capabilities are fundamentally intertwined with determinations of vertical scope. They further argue that capabilities per se are not able to affect the scope of the firm as they interact with transaction costs and also show the existence of four evolutionary mechanisms that explain how firm scope, transaction costs and capabilities co-evolve (Jacobides and Winter, 2005). More importantly, they suggest that transaction costs and capabilities not only work as important antecedents, but, significantly, they co-evolve to affect the vertical scope.

In summary, to understand a firm's scope decisions, researchers have to understand not only the attributes resident in the transaction, but also the firm's core capabilities and the governance context (Madhok, 2002). According to this view, firm scope depends on the comparative advantage that a firm has core capability in a particular segment of its value chain (Argyres, 1996; Jacobides and Hitt, 2005; Jacobides and Winter, 2005). Consequently, a critical task in exploring the antecedents of corporate scope is the identification of the specific capabilities that a firm may exploit through its vertical or horizontal scope decisions (Leiblein and Miller, 2003). While vertical or horizontal diversification may create value in a firm by fully utilizing any firm-specific capabilities (Teece, 1980, 1982). Capability-driven scope antecedents describe different constituent parts and play a complementary role in firm scope decision.

2.2 Dynamic capabilities perspective

Dynamic capabilities are a firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environment (Teece *et al.*, 1997). Eisenhardt and Martin (2000) further identify dynamic capabilities as the firm's specific and distinctive processes relating to the transformation of resource reconfiguration to cope with environmental change. The perspective of dynamic capabilities suggests that to maintain competitive advantage, a firm not only requires the capability to extract economic benefits from current resources and develop new capabilities, but also emphasizes the capability to coordinate, combine, and reconfigure the resources/assets as well as developing new resources/assets to generate competitive advantage, given the firm's path dependences and market positions (Zhan and Luo, 2008). Grant (1996b) and Pisano (1994) demonstrate that dynamic capabilities as the antecedent of organizational and strategic routines by which managers alter their resources base – acquire, integrate, and recombine resources – to generate new value-creating strategies. As such, dynamic capabilities are the drivers

behind the creation, evolution, and recombination of other resources into new sources of competitive advantage (Henderson and Cockburn, 1994). Therefore, it is reasonable to conclude that dynamic capabilities are the antecedent organizational and strategic routines by which managers alter their resource base – acquire and shed resources, integrate them together, and recombine them – to generate new value-creating strategies (Eisenhardt and Martin, 2000, p. 1107).

This study follows the Luo (2002) and Tallman and Fladmoe-Lindquist (2002) studies and conceptualize dynamic capabilities as consisting of two dimensions: capability exploitation and capability upgrading. Specifically, capability exploitation concerns the extent to which a firm exploits rent-generating resources that are firm-specific, difficult to imitate, and able to generate abnormal returns while capability upgrading involves the extent to which a firm commits to building new capabilities through learning from organizations, creating new skills, or revitalizing existing skills in new situations. Capability exploitation is critical for gaining competitive advantages and determining strategies for exploiting such advantages while capability upgrading ensures the growth of sustainable competitive advantage and generates new bundles of resources. Collectively, dynamic capabilities affect a firm's ability to create and use organizational embedded resources in pursuit of a sustained competitive advantage (Luo, 2002).

Several quantitative (Døving and Gooderham, 2008; Kor and Leblebici, 2005) and case study researches (Mota and de Castro, 2004) describe situations where a firm's dynamic capabilities drive corporate scope decisions. For instance, Døving and Gooderham (2008) argue that differences in firms' dynamic capabilities can explain the differences in the scope of related diversification. Using large US law firms as empirical context, Kor and Leblebici (2005) indicate that processes for deploying and developing a firm's strategic human assets are therefore key dynamic capabilities in regard to diversification. Similarly, Mota and de Castro (2004) provide two contrasting case studies of Portuguese moulds industry and contend that firms may choose vertical boundaries not as a response to discrete transactions, but rather as part of the development of their capabilities both direct and indirect, for coping with specific classes of transactions.

3. Hypotheses development

The research attention of this study is the contractual supply relationships undertaken between Western companies and Taiwanese contract manufacturers. In this context, Taiwanese contract suppliers, starting from a low-risk production configuration, improve firm performance internally through resource configuration, and concurrently externally expand the scope of business dynamics. To further analyze and verify the logic of the corporate diversification strategy undertaken by contract manufacturers, this study adopt the theoretical lens of dynamic capabilities in an attempt to establish the theoretical framework on which this research will be based.

3.1 Dynamic capabilities and corporate diversification

3.1.1 Capability upgrading and corporate diversification. To avoid competence trap and core rigidity (Leonard-Barton, 1992; Levinthal and March, 1993), organizations seek new possibilities of capability or innovation in an unfamiliar area of operation. However, building a new capability is a difficult task, which requires effective

organizational processes for new learning (Crossan *et al.*, 1999). To avoid uncertainty and risk, firms seek to upgrade capabilities based on existing ones. The ability to renew and upgrade potentially more valuable capabilities is a critical driver of capability-based growth strategy because these activities can fundamentally alter a firm's competence base, making it easier to pursue new opportunities in the market. Firms upgrade its capabilities based on their existing one, by which firms mainly seek for complementary capability or complementary products.

Upgrading existing capability internally is a way of organic growth (Beaver, 2002), which has the benefit of causal ambiguity making competitors more difficult to imitate. Successful upgrading of current capability would generate novel value-creating opportunities to the firm. This is because the capability upgrading introduces new resource combinations and synergistic relationships that reveal further resources uses (Denrell *et al.*, 2003; Ng, 2007). Due to such discrete nature, capability upgrading induces the specialized growth of firm resources and thus reinforces increasingly corporate diversification (Ng, 2007). For instance, Rindova and Kotha (2001) investigated the Yahoo's transformations and found that such transformations required new capabilities that upgrading from its initial capabilities.

Given the likely presence of path deepening effort (Karim and Mitchell, 2000), however, capability upgrading could also create significant tension inside the organization. First, the environment witnesses time-based competition and unpredictable outcome. Capability upgrading often requires some special types of information and coordination, which may be accomplished more effectively by collaborating with others (Teece, 1992). Second, the newly upgrading capability has high degree of co-specialized assets in nature (Teece, 1988). That is, the more co-specialized assets are associated with capability upgrading, the more collaboration is needed. Due to such complementarity that entails intensive inter-collaboration, embedded risk level is high and the firm may enjoy long run benefits rather than short term ones. Thus, by doing capability upgrading, contractual manufacturer can gain learning advantages to leverage in broader customer scope, and protect co-specialized assets internally (Díez-Vial, 2007). Therefore:

H1a. The degree of vertical diversification will be positively related to the level of capability upgrading the contractual manufacturer is likely to achieve.

H1b. The degree of horizontal diversification will be positively related to the level of capability upgrading the contractual manufacturer is likely to achieve.

3.1.2 Capability exploitation and corporate diversification. To maintain continuous growth, leveraging existing stocks of assets and capabilities, becomes an essential action (Hamel and Prahalad, 1993). This refers to the "balance of processes" in the utilization of resources by Penrose (1959, p. 68). More explicitly, capability exploitation consists of activities in which a firm uses the same or similar capabilities in providing essentially the same kinds of products and services to similar markets (Sanchez, 2003). Indeed, benefits derived from leveraging existing capability result from resource indivisibility and replicability, where economies of scope (Teece, 1982) and static synergy (Christensen and Foss, 1997) can be realized.

The capability exploitation perspective proposes that the exploitation of existing resources and capabilities is conducive to sustainable competitive advantage. In contrast to capability upgrading, the leveraging of existing capability is regarded as an

example of an exploitative type of learning. It occurs when a firm applies its existing capability to current or new markets as opposed to the explorative type of firm behavior which involves qualitative change to existing resources or capabilities (Sanchez and Heene, 1997). Capability exploitation involves a relatively lower level of risk. That is, the further utilization of current capability is an extension of a firm's repertoire, thus contains a moderately lower level of risk of application.

According to this stream of research, there are several reasons why capability exploitation is likely to be a contributing determinant in explaining corporate diversification decision. First, the diversified firm can reduce organizational costs via capability exploitation because it has superior to access prior experience and expertise and thus it is easier to use them (Díez-Vial, 2007). Second, the diversified firm may economize on production costs through capability exploitation due to capability utilization across diversification portfolio (Hoetker, 2005). Third, the diversified firm can protect firm-specific assets by capability exploitation because that cannot be sold due to market imperfections (Markides, 1992).

Applying these ideas to corporate diversification decision, the focal firm can thus reduce uncertainty and develop new business opportunities via capability exploitation. In other words, the risk dimension may be simplified and brought down to a more manageable level. In the parlance of capability-based logic, capability exploitation enables the firm to effectively leverage current capabilities into various applications and performing corporate diversification that largely realize its potential value with lower risk. Therefore:

H2a. The degree of vertical diversification relates positively to the level of capability exploitation the contractual manufacturer is likely to achieve.

H2b. The degree of horizontal diversification relates positively to the level of capability exploitation the contractual manufacturer is likely to achieve.

3.2 Corporate diversification and firm performance

3.2.1 Vertical diversification and firm performance. According to resource-based view, the purpose of structuring vertical diversification is to seek economic rents through both deploying and leveraging existing capabilities which firms are fully developed internally in a cost-effective manner (Madhok, 2000). That is, a firm forms partnerships with others in order to either gain access to the partner's complementary resources for organizational renewal, or for making use of similar resources to achieve economies of scale (Dussauge *et al.*, 2000). Along this theoretical logic, outsourcing emerges as a response to the increasing competitive pressure at the end market by choosing to concentrate on its area of competence while leveraging collaborative partner's area of specialization (Quinn and Hilmer, 1994).

To deepen understanding about the effect of vertical diversification on firm performance, it is important to illustrate the global outsourcing practices that have become part of the competitive strategies used by Western firms. Such international cooperative relationships, based on inter-firm specialization, effectively enhance both outsourcing firms' operating flexibility and competitive position. Intensively adapting industrial outsourcing is even more critical to a firm's global competitiveness in horizontally configured industries (Yoffie, 1997), where fast technological progress and

increasing economies of scale lead to a greater degree of specialization in each stage of the value chain, as evidenced by the evolution of the global computer industry.

Competing in such a high-velocity industry context requires a contractual manufacturer to sustain world-leading product manufacturing and design competencies. However, more challenging to a contractual manufacturer is the uncertainty of the supply relationship. Unlike the conventional long-term or quasi-integrated supply relationship, the buyer-supplier relationship in the contractual manufacturing context is more likely to be periodic. The cost of switching suppliers is low and buyers tend to unquestionably redefine the content of contract. Even though some buyer-supplier relationships can be regarded as interdependent ones, however, it is common for international venders to establish parallel sourcing strategy across different types and levels of products (Dedrick and Kraemer, 1998). All of these transaction natures may challenge the contractual manufacturers and have an influence on firm performance.

Despite the existence of uncertainty in buyer-supplier relationships, a contractual manufacturer will be more likely to upgrade its existing capability for two reasons. First, a supplier's prior unilateral investment could serve as assurances of commitment to perspective buyers (Gulati *et al.*, 1994) and could be critical instruments for structuring supply relationships even when the investment is transaction-specific (Celly *et al.*, 1999). Second, a supplier's constant capability upgrading activities may create its strategic options (Sanchez and Thomas, 1996). For instance, world-class branded venders (e.g. Apple, Dell, and Hewlett-Packard) may select a limited number of suppliers in co-developing new models of products which provide the suppliers preemptive opportunities in future competition. With improvement in product development and manufacturing capabilities, contractual manufacturer can also attract more world-class branded venders and enhancement in visibility and reputation in global competition. These additional enhancements, obtained as a result of expansion of vertical diversification are likely to enhance contractual manufacturer's performance.

There is, however, a limit to the gains in vertical diversification expansion for contractual manufacturer. Following the increase in vertical scope, the increased complexity and corporate governance are damaging contractual manufacturer as it do not have much experience in managing a highly diversified organization (Qian, 2002; Singh *et al.*, 2010). The marginal increase in value-added is not of much help to offset the extra costs result from vertical scope expansion. As a result, vertical diversification is likely to enhance the performance of contractual manufacturer up to a certain point, beyond which, further vertical diversification reduces a contractual manufacturer's performance. Therefore:

H3. There is an inverted U shaped relationship between vertical diversification and the contractual manufacturer's performance.

3.2.2 Horizontal diversification and firm performance. Horizontal diversification refers to the development of new products or extension of current product lines to realize additional business from current customers. According to Penrose's (1959) resource-based approach, horizontal diversification can be regarded as a means of full utilization of current capabilities and attributable to the recognition of the indivisibility of existing resources, realization of scope economy, or simply static

synergy (Teece, 1982). One particular choice is to strategically engage in multiple-customer businesses (Lee and Chen, 2000). Previous research has suggested that the buyer-seller relationship exerts a significant effect on a supplier's performance (Porter, 1980; Cool and Henderson, 1998). More clearly, the result of the buyer structure for a contract manufacturer centers on the level of a buyer's diversity. Within the context of contract manufacturing activities, relying on a limited number of large buyers or on many smaller buyers will reflect different degrees of resource dependence (Pfeffer and Salancik, 1978). The former weakens the supplier's bargaining power, and this result in slimmer profits. To elaborate, if a supplier relies on a very limited number of large buyers, profitability may be squeezed due to a weaker bargaining power. Large buyers take advantage of their size and may not leave too much room for profitability for the supply firm. However, the good thing is that the supplier's sales volume may be more readily ensured due to the quasi-captive nature of the contractual supply.

In the contractual manufacturing context, a manufacturer could leverage its existing capability by conducting multiple business activities using a capability-based system of growth management. One applicable option is to strategically engage in multiple buyer-seller relationships. A contractual manufacturer can realize such an operation by directing its products toward different buyers, which may be located in different geographic areas or market segments. This kind of business operation, based on providing contractual manufacturing services for multiple buyers, is not unusual in global markets (Bartlett and Ghoshal, 1995).

Specifically, the synergistic effects derived from leveraging current capability in order to service multiple customers can be realized with various benefits. First, maximizing the utilization of production capacity can further improve the manufacturer's cost position in the highly competitive contractual supply business. Second, a contractual manufacturer may be able to feedback the product information from buyers, and this, in turn, may strengthen the firm's manufacturing competence. Both the first and the second points could result in an enhancement of performance directly relevant to future collaboration with new customers. Third, engaging in multiple buyer relationships allows the manufacturer to be more flexible in adjusting its excess capacity to respond to the temporary fluctuations of market demand.

In other words, whether a supplier is engaged with a few buyers or with many buyers is a factor which might have influence on the firm performance. We argue that for contractual manufacturer, engaged with a few buyers (lower level of horizontal diversification) will reduce the performance. As firm expand the customer scope and service multiple customers (higher level of horizontal diversification), such expansion can contribute to higher firm performance. As such:

H4. There is a U shaped relationship between horizontal diversification and the contractual manufacturer's performance.

4. Method

Building on the theoretical framework and hypotheses development for firm's corporate diversification, this study explores the antecedents and consequences of corporate diversification. By emphasizing the importance of capability-based drivers that have influences on the firm's corporate diversification, this study shall choose an industry setting that appropriately reflects these specific characteristics. Next, the

purpose of this paper aims to emphasize capability-based corporate growth, which in turn enhances a firm's performance, so relevant sources of data should be able to offer us a clear picture about how firms conduct vertical and horizontal diversification. Finally, variables description and statistical method will be provided at the end of this section.

4.1 The background of contractual manufacturing

In the context of increasing competitive pressure in the early 1980s, Western firms, for the purpose of cost reduction, came to consider Asian firms as their dominant outsourcing partners. Through such cooperative partnerships based on inter-firm specialization, Asian suppliers were indeed able to capitalize on their competitive cost position (Bettis *et al.*, 1992). Because of rapid technological progress and increasing scale economies, adopting industrial outsourcing initiatives has become more critical to a firm's competitiveness in the so-called horizontally configured industries (Yoffie, 1997). The simplest form of cooperative arrangement is original equipment manufacture (hereafter, OEM). In the OEM supply relationship, Asian firms provide manufacturing services based on product designs and standards furnished by Western brand vendors. With the growing manufacturing capability of Asian firms, the OEM system enables them to export large volumes of products using international brands and distribution channels.

In the OEM context, an OEM supplier is able to leverage its existing capability by conducting multiple business activities using a capability-based system of growth management. One applicable option is to strategically engage in multiple buyer-supplier relationships. An OEM supplier can realize such operation by directing its products to satisfy a variety of different OEM buyers, which may be located in different geographic areas or market segments. This kind of business operation, based on providing contractual manufacturing services for multiple buyers, is, in fact, not unusual in global markets (Bartlett and Ghoshal, 1995).

As this study indicates, an OEM supplier competing in such a highly uncertain supply relationship necessitates world-class manufacturing and service capabilities while remaining cost competitive. However, it is worth noting that many global buyers frequently establish parallel sourcing policies to avoid concentrating with a single OEM supplier, and adjust their demand variety based on OEM suppliers' performance. In such circumstance, OEM supplier will devote their efforts on capability enhancement for maintaining the continuity of supply contract. For example, using 82 Taiwanese OEM firms drawing from the information technology and the bicycle industry as empirical context, Kang *et al.* (2009) indicate that OEM suppliers are more likely to make unilateral client-specific investments to gain positive economic spillover values. As such, facing these managerial challenges requires OEM suppliers to develop dynamic capabilities in order to survive and to be successful.

4.2 Sample and data sources

In order to ensure that data are accessible and representative, this study includes manufacturing firms listed in Taiwan Stock Exchange (TSE) or Over-the-counter Stock Exchange (OTC) market. To be included in our sample, the focal firms have to be active in operation during the period of investigation (1998-2006). To avoid the data contamination, this study does not include nascent firms with histories less than five

years. This study also does not include firms that have been in financial crisis or corporate governance problems to ensure data validity. After excluding software, information service, and distribution-based companies, our final sample contained 312 hardware manufacturing companies in Taiwan, including electronic components (112 companies), consumer electronics (nine companies), computer peripherals (66 companies), computer systems (nine companies), main board (37 companies), semiconductor (49 companies), telecommunications equipment (eight companies), and internet equipment (22 companies). Financial and non-financial information about the firms was collected from the Taiwan Economics Journal (TEJ) database, a reputable data bank in Taiwan. This study supplemented the data with information from firms' annual reports. After excluding companies with missing data, a total of 312 electronics and information technology firms for which full data were available, formed the sample of the study. The sample period under investigation covered the nine years from 1998 to 2006.

4.3 Variables and measurements

To test hypotheses, this study creates the key economic performance measures, return on invested capital, and two major categories of explanatory variables, dynamic capabilities and corporate diversification strategy.

4.3.1 Dependent variables. Return on invested capital. This study employ the return on invested capital (ROIC) to measure firm performance, calculated as operating returns divided by the amount of capital invested for firm i in year t. In this investigation, operating returns are the company's earnings before interest, taxes, and depreciation minus the net gain from non-operating investment. The denominator also excludes capital from non-operating investments. According to Copeland *et al.* (2000), ROIC tends to be the indicator reflecting firm's economic growth. In comparison with those traditional accounting measures (e.g. ROA, ROE), ROIC presents the variance of firm's financial input and output, which has particular merits to indicate the efficiency of firm in fulfilling its financial obligation, and thus provide useful information about the position of firm's development and its potential in future growth.

4.3.2 Independent variables

(1) Capability-based growth management:

- *Capability upgrading*. To capture the capability these focal firms upgrade, this study adopt R&D intensity (RDI), calculated by the amount of a firm's research and development expenditures as a percentage of its total sales revenue, as a proxy measure. As suggested earlier, while the efforts made by a contractual manufacturer to constantly upgrading its product design and development competence are vital to the firm's competitiveness in the global outsourcing context (Celly *et al.*, 1999). In addition, we added the patent royalty into the numerator1. In Taiwan high-tech industries, it is a common practice to purchase high-end technologies to quickly upgrade technological competence. It is essential to add back such payment to reflect the firm's real input in capability upgrading. A high level of R&D intensity therefore reflects a manufacturer's high degree of investment on existing product research and development, hence a high degree of capability upgrading.

- *Capability exploitation.* To evaluate a contractual manufacturer's efforts in exploiting its existing capability, this study construct Net Investment on Existing Production Equipment Ratio (NIEPER), calculated as the contractual manufacturer's net production equipment cost divided by the total amount of fixed assets during the year of investigation, as a proxy measure. In order to pursue growth and maintain competitiveness, contractual manufacturer have to at least maintain as the same level of renew production equipment expenditures as the past. In an emerging economy as Taiwan, if the firm is unable to maintain the necessary renew production equipment expenditures, it reveal a negative signal of the firm's commitment to future growth. Within contractual manufacturing context, a high level of net investment on existing production equipment ratio therefore reflects a manufacturer's high degree of dependence on existing production process, hence a high degree of capability exploitation.

(2) Corporate diversification:

- *Vertical diversification.* As for vertical diversification, this study use the Degree of Value-Added (VAD), measured as internally produced revenue divided by the total revenue, referring to a manufacturer's effectiveness of competence building in internal production activities. Taking the global computer industry as an example, it becomes more disaggregated along the value chain; the picture of division of labor is changing, which may affect the extent of value creation of a firm in a particular segment. Different extents of value creation may affect competence management methods and hence final performance.
- *Horizontal diversification.* This study use Customer Diversity (CD) to evaluated the manufacturer's buyer structure and measure the level of horizontal diversification This measure was constructed by taking 1 minus the sum of the square sales percentage for each principal external buyer that accounted for 10 percent or more of the consolidated company revenue. This variable refers to the degree of horizontal diversification mainly at the output stage. A high customer diversity therefore reflects a manufacturer's high degree of reliance on multiple customers, hence a high degree of horizontal diversification.

4.3.3 Control variables. Because the current empirical context focuses on a broadly defined industry, it was unnecessary to control for inter-industry heterogeneity. Nevertheless, four firm-level control variable sources were specified because of their potential impact on contractual manufacturers' performance. First, Firm size (SIZE) is measured as the natural logarithm of the total sales revenue of the sample firm, in the equation to control for the economy of scale factor. Second, Firm age (AGE) is measured as a firm's number of years since firm's establishment to control for the experiential effect. A firm's performance can be dependent on its accumulated experience to compete in the market. Third, Inventory Turnover Ratio (INVT) is measured as the net sales divided by the average inventory level for firm i in year t, refers to a sample firm's operational efficiency in manufacturing-related activities. Finally, Debt ratio (DEBT) is calculated by the total debt divided by total assets for firm i in year t, acted as a good proxy for the firm's financial structure. Effects derived

from financial leveraging (e.g. DEBT) and operational efficiency in manufacturing-related services (e.g. INVT) should be controlled in order to capture a true picture of the effects of corporate diversification on performance.

4.4 Model specification

Previous research has raised serious questions about the econometric techniques traditionally employed to test the diversification-performance relationship and it has attributed contradictory results to the methodology applied (Palich *et al.*, 2000). Specifically, standard regression methods are not able to control for the endogeneity bias from self-selection associated with investigating the diversification-performance relationship (Delios *et al.*, 2008). To correct for this problem, we apply Heckman's (1979) two-stage method. For stage 1, we calculated a dummy variable (1 if the firm implemented corporate diversification, 0 if it did not), which served as the dependent variable in the probit model and calculate the inverse Mills ratio. For stage 2, we added the inverse Mills ratio generated by the stage 1 into a stage 2 general linear square (GLS) models to remove potential bias due to endogeneity and sample selection.

This study specified an empirical model to incorporate the hypothesized antecedents of a firm's economic performance for purposes of empirical testing, as shown in the following equation:

$$\text{Return on Invested Capital}_{\text{i,t}} = \alpha + \text{X}_{\text{i,t}}\boldsymbol{\beta} + \text{v}_i + \varepsilon_{i,t}$$

Where i indicates the number of the firm taken from our sample and t represents the year investigated, Return on Invested Capital $_{\text{i,t}}$ represents the firm-level performance for company i in year t; and ε_{it} is the disturbance term. The $\text{X}_{\text{i,t}}$ term is a vector of the independent variables (capability-based growth management and corporate diversification) and controls, where v_i and $\varepsilon_{i,t}$ are firm fixed-effects and error term, respectively.

Because the data structure contains both cross-sectional and time-series observations, this study uses general linear square (GLS) models to test the hypotheses. GLS models correct for the presence of autocorrelation and heteroscedasticity in panel data (Kmenta, 1986). For an additional robustness check, this study performs a pooled estimation of the empirical model and calculates the variance inflation factors (VIFs). The pooled estimation provides an upper limit that could be used to identify a variance-induced bias. VIF values ranged from 1.06 to 4.65. Since all are below the cutoff value of 10.00, the results do not indicate any major multicollinearity problems.

5. Results

5.1 Regression results

Table I presents the means, standard deviations, and correlations of the variables in this paper. Table II reports the empirical results of probit regression in stage 1. The model shows that possible endogeneity from self-selection associated with firm's diversification decision. For this reason, we input the inverse Mills ratio obtained from the selection model into the stage 2. The GLS regression results using the corporate diversification and return on invested capital measured as a dependent variable separately are given in Tables III and IV. To test proposed hypotheses, this study specifies the explanatory variable for proxy manufacturer's capability-based growth

Table I. Descriptive Statistics and Correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8
1 Return on invested capital (ROIC $_{t)}$	0.11	0.11								
2 Firm size[a] (SIZE $_{t)}$	14.61	1.52	0.07*							
3 Firm age (AGE $_{t)}$	20.24	10.51	−0.07*	0.36*						
4 Inventory turnover ratio (INVT $_{t)}$	12.28	19.50	−0.00	0.15*	0.12*					
5 Debt ratio (DEBT $_{t)}$	0.40	0.16	−0.15*	0.17*	−0.09*	0.04*				
6 R&D intensity (RDI $_{t)}$	0.05	0.34	−0.11*	−0.21*	−0.11*	−0.04*	−0.08*			
7 Net investment on existing production equipment ratio (NIEPER $_{t)}$	0.43	4.33	−0.03	−0.12*	−0.12*	−0.03	−0.02	0.02		
8 Degree of value-added (VAD $_{t)}$	0.28	0.65	−0.04*	−0.16*	−0.07*	−0.07*	−0.04*	0.27*	0.03	
8 Customer diversity (CD $_{t)}$	0.88	0.14	0.02	−0.04*	0.12*	−0.09*	−0.06*	−0.02	−0.04*	−0.03

Notes: [a] Logarithm; * $p < 0.05$

Table II.
Results of probit regression

	Corporate diversification	
Constant	−1.8390	(0.359)***
RDI	−0.1451	(0.137)
NIEPER	−0.0146	(0.008)*
SIZE	0.2178	(0.027)***
Age	0.0092	(0.003)***
INVT	−0.0105	(0.001)***
DEBT	−0.4707	(0.203)**
Chi-square	164.05***	
Observations	2,808	

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; $n = 312$; Standard deviation in parenthesis

management (i.e. capability upgrading and capability exploitation) and for measuring corporate diversification (i.e. vertical diversification and horizontal diversification) separately. The details on our empirical results are discussed in order.

With the specification of Model 2 and Model 4 in Table III, the hypothesized positive relationship between a firm's capability upgrading and vertical diversification succeeds in obtaining empirical support. Regarding the impact of capability upgrading on a firm's vertical diversification, results show that a manufacturer characterized by higher degree of capability upgrading will have a higher level of vertical diversification. *H1a* is supported, indicating that focal firms' levels of vertical diversification are significantly influenced by capability upgrading. With regard to the estimation results from Model 8 in Table III, the findings report that a firm's degree of capability upgrading exhibits a positive relationship with its horizontal diversification. *H1b* is supported. These findings suggest that capability upgrading does affect the firm's corporate diversification decision.

H2a predicted that capability exploitation will have a positive effect on vertical diversification. However, as Model 3 and Model 4 respectively show in Table III, a firm's degree of capability exploitation exhibits a negative relationship with its vertical diversification. For this reason, we do not consider these findings to be supportive of *H2a*. Next, with the specification of Model 7 and Model 8 in Table III, the hypothesis of a positive relationship between capability exploitation and horizontal diversification succeeds in obtaining empirical support. However, the coefficients for the terms is not significant. Hence, *H2b* is not supported. Regarding the impact of capability exploitation on a firm's vertical and horizontal diversification, results show that a manufacturer characterized by higher degree of capability exploitation will not have a higher level of vertical and horizontal diversification.

Further, this study tests the effect of corporate diversification on a firm's performance. *H3* predicts that there is an inverted U shaped relationship between vertical diversification and the contractual manufacturer's performance.. As Model 3 and Model 6 respectively show in Table IV, a firm's level of vertical diversification exhibits an inverted U shaped relationship with its performance. Thus, *H3* is supported. Next, *H4* predicts that there is a U shaped relationship between horizontal diversification and the contractual manufacturer's performance.. With the specification of Model 5 and Model 6 in Table IV, the hypothesized U shaped relationship between horizontal diversification and economic performance succeeds in obtaining empirical

Table III. Results of regression analysis for the antecedents of corporate diversification

Variables	Vertical diversification								Horizontal diversification							
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
RDI			0.7624***	(0.053)			0.5951***	(0.092)			0.0377	(0.032)			0.161***	(0.056)
NIEPER					−0.0060**	(0.003)	−0.0042	(0.003)					0.0011	(0.002)	0.0017	(0.002)
SIZE	0.0119	(0.009)	0.0008	(0.010)	0.0148	(0.012)	0.0004	(0.010)	−0.0046	(0.005)	−0.0128***	(0.006)	−0.0055	(0.006)	−0.0098*	(0.006)
AGE	0.0006	(0.001)	0.0007	(0.001)	0.0006	(0.001)	0.0004	(0.001)	0.0023***	(0.001)	0.0021***	(0.001)	0.159***	(0.032)	0.0025***	(0.001)
INVT	−0.0028***	(0.001)	−0.0016**	(0.001)	−0.0030***	(0.001)	−0.0016**	(0.001)	−0.0007*	(0.001)	−0.0003	(0.001)	−0.0008*	(0.001)	−0.096***	(0.011)
DEBT	−0.1794***	(0.041)	−0.1116***	(0.041)	−0.1831***	(0.048)	−0.1146***	(0.040)	−0.0564***	(0.022)	−0.0345*	(0.025)	−0.0623***	(0.024)	−0.0004	(0.001)
Mills ratio	0.2794**	(0.132)	0.0622	(0.162)	0.3140*	(0.166)	0.0530	(0.166)	0.0611	(0.090)	−0.0632	(0.100)	0.0668	(0.092)	−0.0122	(0.103)
Constant	0.161	(0.156)	0.2571	(0.180)	0.0697	(0.199)	0.2819	(0.179)	0.9201***	(0.082)	1.0569***	(0.111)	0.9293***	(0.107)	0.9935***	(0.110)
Wald X^2	176.45***		582.08***		192.01***		252.09***		139.09***		232.54***		238.09***		243.26***	

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; $n = 312$; Standard deviation in parenthesis

Table IV. Results of regression analysis for the consequences of corporate diversification

	Return on invested capital											
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
VAD			−0.0018	(0.015)	0.0576***	(0.023)					0.0585***	(0.023)
VAD^2					−0.0634***	(0.018)					−0.0642***	(0.018)
CD							0.0315	(0.023)	−0.2410**	(0.123)	−0.2455**	(0.123)
CD^2									0.1963**	(0.087)	0.1972**	(0.087)
SIZE	0.0114**	(0.005)	0.0115**	(0.005)	0.0245***	(0.006)	0.0118**	(0.005)	0.0119**	(0.005)	0.0251***	(0.006)
AGE	−0.0027***	(0.001)	−0.0027***	(0.001)	−0.0024***	(0.001)	−0.0027***	(0.001)	−0.0026***	(0.001)	−0.0025***	(0.001)
INVT	0.0007	(0.001)	0.0001	(0.001)	0.0004	(0.001)	0.0007	(0.001)	0.0006	(0.001)	0.0004	(0.001)
DEBT	−0.3334***	(0.025)	−0.3338***	(0.025)	−0.3525***	(0.026)	−0.3326***	(0.025)	−0.3316***	(0.025)	−0.3510***	(0.026)
Mills ratio	−0.1405	(0.096)	−0.1375	(0.099)	0.1464	(0.013)	−0.1392	(0.097)	−0.1431	(0.096)	0.1492	(0.128)
Constant	0.1637*	(0.089)	0.1619*	(0.090)	0.0829	(0.114)	0.1311	(0.092)	0.2138**	(0.099)	−0.0335	(0.121)
Wald X^2	292.43***		293.83***		302.64***		290.85***		294.59***		304.85***	

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; $n = 312$; Standard deviation in parenthesis

support. Thus, *H4* is supported. Regarding the impact of corporate diversification on a firm's performance, empirical results show that a manufacturer characterized by higher level of vertical and horizontal diversification has curvilinear relationship with firm performance.

6. Discussion

Employing the conceptualization of dynamic capabilities through the delicate management of capability upgrading and capability exploitation activities, this study seems to provide dynamic insights for exploring the antecedents and consequences of corporate diversification and implications for investigation in the impact of capability-based growth strategy and the effect of corporate diversification on firm performance. This research does so by drawing on insights from the dynamic capabilities approach in the context of contractual manufacturing. This study argues that dynamic capabilities would enable firms to expand and also act as important antecedents of corporate diversification. On the other hand, a firm's degree of corporate diversification has significant impact on the firm performance.

Another research focus of this study is the employment of vertical diversification and horizontal diversification variables, in order to capture a useful image of a firm's corporate diversification. Each variable represents a straightforward element in a firm's corporate diversification strategy. As discussed above, a contractual manufacturer can upgrade and exploit its capability based on building vertical specialization to broader vertical scope or leveraging capability to expand horizontal scope for purposes of performance enhancement. As such, this study constitutes some further support for the economic performance to be derived from corporate diversification (e.g. Hill *et al.*, 1992; Markides and Williamson, 1994; Miller, 2006).

While corporate diversification remains an important research topic within strategic management, investigation tends to focus on the consequences of types and degree of diversification rather than the antecedents of corporate diversification in the first place (Hoskisson and Hitt, 1990; Miller, 2006). This study addresses this deficiency by specifying essential underlying antecedents which do matter. To pursue a profitable growth by corporate diversification, a firm may have to delicately manage both dynamic capabilities and performance enhancement in a relevant manner.

6.1 Implications for research and practice

This study contributes to the diversification literature in three ways. First of all, this study sheds new light on corporate diversification by applying dynamic capabilities perspective based on the effects of capability upgrading and capability exploitation on the degree of corporate diversification. We hypothesize that dynamic capabilities would enable firms to expand their corporate scope (Døving and Gooderham, 2008). Second, following a convergence between TCE and RBV, this research proposes a capability-based approach to the dynamics of vertical and horizontal diversification determination, and illustrates the antecedents and consequences of corporate diversification. Our results indicate that the nature and magnitude of capabilities that focal firm accumulated exercise critical impacts on their contrasting diversification patterns (Colpan and Hikino, 2005). Third, the topics of firm capabilities and corporate diversification have received attention in the strategic management literature in recent years, but extant knowledge is primarily based on the

developed economies (Wan, 2005; Chakrabarti *et al.*, 2007). This study emphasis on exploring the antecedents and consequences of corporate diversification in a small emerging economies (i.e. Taiwan). We extend corporate diversification research in Asia by adding to the empirical investigation on East Asia and emerging economies (Chakrabarti *et al.*, 2007).

Moreover, this study also contributes to business practice. Firstly, firms should manage portfolios of capability upgrading and capability exploitation. As this research proposes, capability upgrading will exert positive influence on corporate diversification. Secondly, managers have to conduct econometric analyses to find out a firm's optimal level of corporate diversification for performance maximization. Finally, managers will have to be more careful in developing dynamic capabilities and corporate diversification strategies that are most appropriate for firm from emerging economies.

In sum, this study makes both theoretical and managerial contributions by demonstrating the antecedents and consequences of corporate diversification based on dynamic capabilities perspective. Firms will increase its degree of vertical or horizontal diversification via capability upgrading and exploitation, thus enhancing firm performance via corporate diversification.

6.2 Limitations and future research directions

This study comprises several deficiencies due to the exploratory nature of the research design and the inherent limitations of some measurements. First of all, the study uses the degree of value-added as vertical diversification measure for a manufacturer's effectiveness in internal production activities. Taking the global computer industry as the example, this industry becomes more disaggregated along the value chain; the picture of division of labor is changing, which may affect the extent of value creation by a firm in a particular segment. The future research should consider this important phenomenon in an attempt to explore firms' endogenous growth.

Second, taking the horizontal diversification as the example, this study focuses on customer diversity ratio as the key measurement for a contractual supplier's efforts in leveraging its capabilities, which tends to underestimate the difficulty and complexity of capability leveraging. From prior experience in capability-based management, capability leveraging refers to a firm's efforts in applying its existing capability or competence to current or new market opportunities. In other words, further study that delineates how leveraging efforts are undertaken by firms in product or geographic dimension is needed.

Finally, this study may also suffer from all the limitations that usually occur in single-country and single-industry category analysis. Future research may extend the application of our conceptualization to other industries. Looking closely at industry heterogeneity may provide more insights regarding a variety of capability-based management within the context of corporate diversification. Extended research that applies the current logic to other industries may prove to be fruitful in identifying both opportunities and constraints for forms of diversification and firm performance, and this will no doubt have significant implications for a firm's strategy formulation.

7. Conclusion

As strategic outsourcing and inter-firm specialization have evolved as important features of the modern industrial landscape (Hitt *et al.*, 1999), building up a value-creating contractual collaboration by both capabilities upgrading and exploitation constitutes a key element of competitive advantage (Dyer and Singh, 1998; Madhok and Tallman, 1998). The establishment of a value-creating contractual collaboration not only lies in an efficient arrangement, which yields rents through low transaction costs, but also through an effective arrangement, which could realize rents through value-creating initiatives that are unique to the contractual collaboration. By encompassing capability-based growth strategy into existing TCE and RBV consideration on corporate scope dicision, this study investigates the antecedents and consequences of corporate diversification based on dynamic capabilities perspective.

This research provides the investigation into the linkage between the capability-based growth strategy and the antecedents and consequences of corporate diversification. By including capability upgrading and capability exploitation implication into the ongoing conversation on corporate diversification strategy, this study highlights how a firm, which manages its corporate growth path based on the interplay between capability upgrading and capability exploitation, shall become an integral inquiry for advancing understandings of dynamic growth strategy.

Note

1. The amount of patent royalty has to be separately listed under the section of operating expenses in accordance with Taiwan generally accepted accounting principles, consistently applied ("GAAP").

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