



# International Diversification Effects on Korean Information Service Firms

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## Abstract

**Purpose** – International diversification, a critical issue in research and practice, undoubtedly represents a growth strategy with great potential impact on firm performance. Although the literature has widely examined the relationship between international diversification and firm performance in international business and strategic management research, it remains unconfirmed. This study, therefore, aims to clarify the relationship as it relates to information service firms.

**Research design, data and methodology** – To examine the international diversification-performance relationship, this study uses a sample of major Korean service firms spread over four industries spanning a period of five years between 2005 and 2009. In this study, generalized least square was used to analyze the relationship between international diversification and performance of service firms.

**Result** – The result showed the U-shaped curvilinear form between international diversification and performance in service firms. Especially, IT service firms may differ from other service firms that the negative effect of internationality may have weaker than other types of service firm.

**Conclusion** – Based on the empirical results, the U-shape relationship between international diversification and performance is confirmed in Korea service firms. Furthermore, information service firm may reduce the initial internationalization cost by transferring codified and digitized information using information and communication technology, so that gain benefit from early international expansion.

**Keywords:** International Diversification, Internationalization, Performance, Service, Information Service, Information Technology

**JEL Classification Code:** M10, M31.

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## 1. Introduction

Over the past two decades, the study of the relationship between diversification and firm performance has surfaced as a main issue among international business and strategic management scholars (Capar & Kotabe, 2003; Kim, 2009). In particular, many firms have employed international diversification strategy as a significant growth strategy because of the expected benefits from internationalization (Chandler, 1962; Ansoff, 1965; Capar & Kotabe, 2003).

Many scholars have attempted to clarify the relationship between international diversification and firm performance. One stream of research considers the relationship between international diversification and performance *monotonic*: positively or negatively linear (Delios & Beamish, 1999; Doukas & Travlos, 1988; Errunza & Senbet, 1984; Denis, Denis, & Yost, 2002; Geringer, Tallman, & Olsen, 2000). Another stream of research proposes a non-linear relationship between international diversification and performance, an inverted U-shape and U-shaped curvilinear form (Hitt, Hoskisson & Kim., 1997; Gomes & Ramaswamy, 1999; Lu & Beamish, 2001; Capar & Kotabe, 2003; Kim, 2009). More recently, researchers have integrated previous studies to suggest an S-curve relationship between international diversification and performance (Contractor, Kundu & Hsu., 2003; Lu & Beamish, 2004).

Most researchers examining the international diversification-performance relationship base their studies on samples of manufacturing firms. However, only limited research has explored the service sector. Capar and Kotabe (2003) and Contractor et al. (2003) emphasize that service firms offer considerable contributions to both job growth and economic growth in industrialized nations. In fact, the internationalized service sector has increased firm size and scope rapidly (Cambell & Verbeke, 1994). Also, the authors assert that service firms have a different form of international diversification-performance relationship because of the nature of service businesses such as intangibility, inseparability of production and consumption, heterogeneity, variability, and regulation (Campbell & Verbeke, 1994). Therefore, this study looks specifically at the international diversification-performance relationship in the service industry.

Despite numerous studies that have examined the relationship of international diversification and performance, few authors have looked at the new business sector. This paper attempts to examine the relationship between international diversification and performance for information service firms using the Korean service industry. Due to an increase in the demand for information technology (IT), which includes hardware and software, the IT industry and information technology services have grown approximately 4% and 3.4%, respectively, since 2005 (Gartner, 2008). Therefore, this study investigates how international diversification affects performance for information service firms.

Although information service firms may share similar characteristics with general services, some differences occur between the two based on the heterogeneity of the nature of service. Information services can easily adapt to international supply due to the codifiability, standardization, and synchronization of information technology that decreases managerial costs and transaction hazards (Rangan & Sengul, 2009). Moreover, information services have features of knowledge-based services, such as a lower burden of tangible assets and customer following. Compared with other service sectors, the information service sector may have a different relationship between international diversification and performance. To examine the international diversification-performance relationship, this study uses a sample of major Korean service firms spread over four industries spanning a period of five years between 2005 and 2009.

By illustrating the effect of service firm's international diversification on performance, this study contributes to extend international diversification literature to service industry. As the economic scale of service industry rapidly increases, there is a need for more active discussion of the internationalization of service firms. In this vein, this paper argues the difference among service sectors, that information service is a knowledge-based resource which have low burden of large physical asset. It implicates that information service firm may have more advantage to international expansion than other service sectors. Using Korea service firms, this paper advances the internationalization study Asian service firms.

This paper is organized as follows. The first section synthesizes earlier theoretical background and a literature review of the relationship between international diversification in manufacturing and service firms. The next section explains the research methods of this study. The third section presents the results. Finally, the discussion and conclusion provide a review of the study along with the identification of limitations and future possible research.

## **2. Literature Review**

### **2.1. International diversification and firm performance**

International diversification offers various benefits to firms. For example, Buhner (1987) noted that international diversification offers prospective market opportunities as well as opportunities for great growth. The most prominent case for international diversification argues on the theoretical assumption that firms achieve benefits of internationalization through exploitation of international markets (Hymer, 1976; Rugman, 1981; Caves, 1982; Capar & Kotabe, 2003). Performing activities internationally has several advantages, such as economies of scale, scope, and international learning (Kogut, 1985; Ghoshal, 1987; Kim et al., 1989, 1993), sharing core competencies among different geographic markets and business segments (Hamel, 1991; Porter, 1990; Capar & Kotabe, 2003), and exploiting differences in factor markets (Porter, 1990; Hitt et al., 1997). Thus, some argue that the higher the involvement of a firm in international markets, the higher the exploitation of tangible and intangible resources, which experts expect to lead to higher performance (Hymer, 1976; Capar & Kotabe, 2003). These attributes of international diversification relate primarily to the resource- and knowledge-based view of the firm (Barney, 1991; Kogut & Zander, 1993), and on internationalization theory in international business literature (Buckley & Casson, 1976; Hymer, 1976, Hitt et al., 1997; Capar & Kotabe, 2003).

In addition, internationalization offers the opportunity to integrate a firm's activities across borders by standardizing products, rationalizing production, and appropriately allocating resources (Korbin, 1991; Capar & Kotabe, 2003). Indeed, multinational firms can gain additional competitive advantages through exploiting market imperfections and cross-border transactions. Also, multinational firms can acquire greater bargaining power with increased size (Sundaram & Black, 1992; Capar & Kotabe, 2003). The above arguments support a positive linear relationship between international diversity and performance.

On the other hand, other studies have shown a negative or no relationship. For example, Geringer et al. (1989) did not find a positive linear relationship between international diversification and performance. Scholars who argue for a negative relationship between international diversity and performance emphasize the costs, which increase with a firm's internationalization. They hold that when firms expand internationally, they pay dearly in economic and psychological costs. Furthermore, the higher levels of international diversity, the more serious the issues of inefficiency in management, such as increasing transaction costs and information processing demands. According to transaction cost theory, the higher the degree of diversification the higher governance cost for firms (Williamson, 1975; Hitt et al., 1997; Capar & Kotabe, 2003). For instance, international diversity increases coordination, distribution, and management costs. To achieve the benefits of economies of scale and scope requires coordination across units in multiple geographic locations. However, it remains hard to monitor and control multiple subsidiaries distributed geographically. The local markets offer heterogeneous environments, such as culture, economy, politics, and other managerial obstacles (Li & Qian, 2005; Kim, 2009). Dealing with factors including logistics, trade barriers, cultural diversity, government regulation, trade laws, and currency fluctuations will likely increase costs and complexity of operations.

Despite many attempts, researchers have not confirmed a linear relationship and found mixed results on the relationship between international diversification and firm performance (Gomes & Ramaswamy, 1999; Capar & Kotabe, 2003; Kim, 2009). Some researchers focused on the complexity of the relationship regarding non-linear relationship between international diversification and performance. The researchers who suggested the inverted U-shaped relationship combine the resource-based view and the transaction cost theory. They emphasize that international diversification must offer benefits from market opportunities, scale economies, and risk diversification. However, the problems caused by too high a level of international diversity increase complexity and costs of operations, such as coordination costs and bureaucratic costs (Jones & Hill, 1988; Denis et al., 2002; Kim, 2009).

Others in the stream of nonlinear relationship research prefer the U-shaped relationship. They assume that the liabilities of newness and foreignness exist in new foreign market entries (Hymer, 1976; Kim, 2009). The liability of newness refers to disadvantage and unfavorable situations, which a firm experiences in new subsidiary operations. The liability of foreignness refers to the environment a firm faces as a foreign, as opposed to local firm. The local government may discriminate against foreign firms in favor of local ones. Foreign firms may experience disadvantages because they lack knowledge of the local business environment in terms of national culture or market needs (Kim, 2009). However, firms may overcome these liabilities of newness and foreignness by accumulated experience and knowledge, and the opportunities from diverse markets increase as the firm becomes more internationalized (Barkema, Bell, & Pennings, 1996; Kim, 2009). Therefore, performance is initially negative and turns into positive one beyond a certain point. This would demonstrate the U-shape curvilinear route.

At the end of the 1990s, some researchers found the relationship between international diversification and performance much more complex and dynamic than prior studies had reported. Contractor et al. (2003), for example, argue for a horizontal S-curve, with a negative effect of international diversification caused by the liability of newness. It then becomes positive beyond a certain point, but then, again, turns negative. The positive term can be explained by experiential learning, increased market power, and realizing economies of scale. Despite the positive effect, too high a level of international diversity causes increasing costs and managerial obstacles, which can impair a firm's performance (Contractor et al., 2003; Lu & Beamish, 2004; Kim, 2009).

## **2.2. International diversification and firm performance**

The previous section synthesized the literature on the relationship between international diversification and firm performance. However, these authors largely base their observations on manufacturing industry firms. Although numerous studies examine the effect of international diversification, few have looked at the service sector.

The service industries have consistently developed during recent decades. The international expansion of service firms has led to increased attention among researchers to study the various aspects of the internationalization of service firms (Capar & Kotabe, 2003). Some researchers argue that service firms expand internationally for the same reasons as manufacturing firms (Guile, 1988). However, Capar and Kotabe (2003) assert that some differences exist between manufacturing and service on the effect of international diversification performance. In contrast to earlier studies that show results in a linear or inverse U-shape relationship, Capar and Kotabe (2003) argue for a U-shape curvilinear relationship for service firms. They assert that the different relationship may result from different characteristics. Thus, services firms will likely face declining performance during the initial period for the following reasons. First, many countries still have strong restrictions on the extent of foreign involvement in service sectors (Feketekuty, 1988). The strict constraints include ownership restrictions, domestic preference policies, unfavorable tax regimes, and unbalanced employment rules (Knight, 1999; Capar & Kotabe, 2003). Second, services require local adaptations, that is, linguistic and cultural differences of customers, along with the intangible nature of most services (Zeithmal et al., 1985; Patterson & Cicic, 1995). Third, both production and consumption occur simultaneously in service—many services have the nature of location-boundedness or inseparability of service. This forces the buyer into close contact with the production process (Carman & Langeard, 1980; Capar & Kotabe, 2003). For these reasons, when service firms make an initial expansion abroad, firms should prepare for high investment in the venture. Such investments will likely increase costs and then decline performance of firms (Boddewyn et al., 1986; Capar & Kotabe, 2003).

As service firms further increase their investment in foreign markets, they gain benefit from economies of scope and scale in the long run (Ghoshal, 1987). These firms may have cost savings from economies of scope through worldwide learning and sharing cost-producing activities across geographic markets. According to Lovelock and Yip (1996), some service firms also benefit from economies of scale by standardizing products for global customers and centralizing upstream value chain activities (Capar & Kotabe, 2003). Therefore, I can summarize the above by proposing a U-shaped curvilinear relationship between international diversification and performance in service firms.

## **3. Hypotheses**

### **3.1. The relationship between international diversification and performance in Information service firms**

Service firms provide, to some extent, intangible items in the interaction between buyer and seller (Berthon et al., 1999; Capar & Kotabe, 2003). Information service firms provide more intensive intangible items to customers or suppliers. The aforementioned arguments proposed that service firms have three characteristics. Information service firms may have similar characteristics. When information service firms make an initial expansion abroad, they may experience liabilities of foreignness caused by strong strict regulations of the host country and high investment costs to provide both localized and standardized products. These firms may also face liabilities of newness, such as high local requirements in terms of infrastructure (Hymer, 1976; Kim, 2009). These problems increase costs and thereby reduce performance (Boddewyn et al., 1986; Capar & Kotabe, 2003). While these firms maintain consist investment in foreign markets, they may achieve economies of scale and scope and thereby increase performance. As service firms, information service firms will show a U-shape relationship between international diversification and performance.

**Hypothesis 1:** The relationship between international diversification and performance in information service firms will take a U-shaped curvilinear form.

According to Boddewyn et al. (1986), substantial differences may occur in the above-mentioned characteristics, such as intangibility, perishability, and simultaneity (Contractor et al., 2003). Indeed, recent work examining the relationship between performance and international diversification has introduced *moderating* variables I can use to distinguish between types of firm. Kotabe et al. (2002) noted that the degree of performance benefits from the same level of internationalization can vary based on their capability to maximize the gains of multinationality while minimizing the relevant costs of expansion (Contractor et al., 2003).

Many studies distinguish a sample firm's base on intangible assets such as R&D and marketing capability. On the other hand, Contractor et al. (2003) distinguish between the capital-intensive service sector and knowledge-based service sectors. The present study distinguishes between non-information service sectors and information sectors, which are more information-technology driven. As information technology has grown and developed, most industries have utilized many types of information technologies. In this light, some scholars have focused on the effect of information technology (IT) on multinational enterprises. Scholars argue that IT may set off transaction characteristics and transaction cost (Argyes, 1999; Baker & Hubbard, 2003, 2004; Brynjolfsson, 1994; Brynjolfsson et al., 1994; Gurbaxani & Whang, 1991; Zenger & Hesterly, 1997; Rangan & Sengul, 2009). Rangan and Sengul (2009) asserted that IT can facilitate cost efficient and effective observability and monitoring. This means that IT can help reduce costly information asymmetry and lessen the need for integration. Also, IT makes coordination easier and cheaper since it enables the development and diffusion of a technical grammar that makes inter-firm communication much more efficient.

In terms of knowledge and information, IT can facilitate coordination—not only internal exchange across specialized areas but also across geographically dispersed locations. This means that codifying and digitizing information can aid cost-effective dissemination. Furthermore, IT can enable knowledge workers dispersed across countries to collaborate and work simultaneously on such projects. In contrast to general services, IT service will require less location and time boundedness. According to Contractor et al. (2003), knowledge-based services have three different advantages: (1) they have a lower burden of tangible asset investment; (2) they have clients who want to adopt the service (Contractor et al. (2003) explained that knowledge-based services have clients already established abroad); and (3) they can provide globally standardized goods, which lowers the cost of foreign entry and enables net profit of international expansion. This means that IT service offers a combination service, with part of the production process location-bound and another part capable of producing a foreign-tradable product (Boddewyn et al., 1986). For example, in remote computer data-processing, the customer's participation in production can take place at a different national site. In sum, IT services can reduce transaction hazards such as transaction costs and enhance efficient coordination and worker collaboration. Hence, I further hypothesize:

**Hypothesis 2:** The negative effect of internationality on performance is less distinct for information service firm than others.

## 4. Methodology

### 4.1. The sample

The sample consists of Korean service firms from four service industries: retail/wholesale, transportation, information service including information technology (IT) service, and business and technology. The sample was drawn from firms listed in the Korean Stock Exchange. This study selected the four service industries based on the rationale that a large portion of firms that operate in service areas serve as major players in international markets and that an adequate number of firms represent those industries (Gomes & Ramaswamy, 1999; Capar & Kotabe, 2003). This sample also satisfied the significant condition that the firms had available all the data needed for analysis.

The resulting sample consisted of 72 major service firms spanning four industries (retail/wholesale, 17; transportation, 3; information service, 42; business & technology, 10). Data used in the empirical analysis came from KisValue collected for a five-year period between 2005 and 2009 and include the 360 pooling data of the sample.

## 4.2. Variables and measures

This study used performance return on sales (ROS) to measure firm performance as a dependent variable calculated by dividing net income by total asset. The use of financial-based profitability measures has received criticism; the most critical limitation has it that this financial measure reflects only past performance. Although some researchers criticize using only financial performance, many studies have used this measure (Buckley, Dunning, & Pearce, 1977; Capar & Kotabe, 2003; Grant et al., 1987; Geringer et al., 1989; Sullivan, 1994; Kim, 2009) largely due to its easy accessibility and availability. Some researchers have attempted to use return on asset (ROA) for performance. Hitt et al. (1997) asserted that both ROA and ROS have generated similar findings and that they are highly correlated (Capar & Kotabe, 2003). Moreover, service firms will likely possess significant portions of intangible assets. Indeed, these intangible assets differ among each service sector (Caper & Kotabe, 2003). Thus assets-based performance measures may not consider this difference. This study also used ROS as a firm-performance measure mainly due to data availability.

**Internationalization** The literature includes arguments about the measurement of international diversification (Sullivan, 1994; Ramaswamy, Kroeck & Renforth., 1996; Hitt et al., 1997; Gomes & Ramaswamy, 1999; Capar & Kotabe; 2003; Kim, 2009). Sullivan (1994) offered a multidimensional measure consisting of five items. In addition, Ramaswamy et al. (1996) considered the use of single-item measures. Some studies attempt to employ the number of subsidiaries of a firm and countries in which the firm operates. However, many previous studies focus on the measurement as the ratio of foreign sales to total sales (FSTS). Although FSTS are usually adopted for international diversification measures, this study uses an export-intensive measure as the ratio of foreign sales to total sales (Kim et al., 2010) because of data availability constraints.

**Control variables and moderator** Consistent with previous studies (e.g., Gomes & Ramaswamy, 1999) this study uses firm size and industry effects as control variables (Capar & Kotabe, 2003). Some researchers insist that firm size can partly explain the varied performance among firms (Hitt et al., 1997; Kim, 2009). To avoid potential effects of different scale economies, I should include firm size in the research model because firm size could affect performance. I can measure firm size by the value of sales (Hitt et al., 1997; Gomes & Ramaswamy, 1999), the value of assets (Caves, 1971; Chang & Wang, 2007), or the number of employees (Kim, Hwang, & Burgers, 1989; Capar & Kotabe, 2003; Geringer, Tallman, & Olsen, 2000). The present study includes firm size as measured by the amount of total assets and calculated using a natural logarithm.

This study controlled for industry effects by using three industry dummy variables representing the four industries (I<sub>1</sub>=retail/wholesale, I<sub>2</sub>=transportation, I<sub>3</sub>=information including IT, I<sub>4</sub>=business & technology). The retail/wholesale industry represents the residual dummy variable. Simultaneously, I consider these industry variables as moderate variable to compare international diversification effect among industries.

## 4.3. Statistical Method

The present data may not suit ordinary least square (OLS) regression analysis because of heteroscedasticity. Principally, classical linear regression function assumes homoscedasticity—all having the same variance (Gujarati, 1988; Kim, 2009). However, the 5-year pooling data of this study will not likely satisfy this assumption. To avoid the problems of OLS and the issue of heteroscedasticity, this paper used the generalized least square (GLS) regression. In contrast to OLS, GLS takes such information that includes the unequal variability of the dependent variable into account explicitly and, therefore, can create BLUE (the best linear unbiased estimator) estimators (Gujarati, 1988; Kim, 2009).

## 5. Results

Table 1 presents means, standard deviations, and bivariate correlations for the variables in this study. The correlations among the variables report no problem of multicollinearity.

**Table 1:** Means, standard deviations, and correlation (n=72, observation=360)

Variable	Mean	Std	.1	2	3
1. Firm performance	-0.2028	1.10246	1		

(ROS)					
2. Firm size (SIZE)	<sup>a</sup> 25.2247	1.64791	0.1731**	1	
3. Internationalization (Intl.)	0.42353	0.30342	-0.0922 <sup>†</sup>	0.1615**	1

<sup>a</sup> logarithm variable  
<sup>†</sup> p<0.10; \* p<0.05; \*\* p<0.01

Table 2 reports the results for linear model and curvilinear model of the relationship between international diversification and performance. The first regression serves as an examination of the linear effect of international diversification on ROS. As we can see, Internationalization (INTL.) shows statistically insignificant on performance (ROS). Firm size, as a control variable, shows a statistically significant positive relationship between SIZE and performance at p<0.01 level. The second model in Table 2 shows support for our assumption that the relationship between international diversification and performance in service firm has a U-shaped curvilinear form. As seen, both the coefficient of the internationalization (INTL.) and the squared internationalization term (INTL.<sup>2</sup>) are statistically significant at p<0.01. The sign of the linear effect shows that the initial internationalization will negatively affect a firm’s performance whereas the sign of the curvilinear effect becomes positive, indicating a U-shaped relationship.

Among the industry variables, in addition, both the IT service sector and the Business service sector show statistical significance and had positive slope coefficients. In other words, knowledge-based services will more likely show good performance than other service sectors.

Table 2: Results of Regression Analysis of service firms

VARIABLE	ROS				
	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	-4.601** (1.493)	-4.567** (1.532)	-4.886** (1.568)	-4.722** (1.606)	-4.492** (1.561)
SIZE	0.164** (0.059)	0.175** (0.061)	0.187** (0.062)	0.188** (0.064)	0.191** (0.063)
Internationalization (INTL.)	0.216 (0.272)	-2.597** (0.933)	-2.820* (1.106)	-4.266* (1.679)	-5.221** (1.259)
Internationalization squared (INTL. <sup>2</sup> )		3.017** (0.935)	3.408** (0.982)	4.888** (1.578)	5.566** (1.320)
INTL. X I <sub>2</sub> (Transportation)			-0.413 (10.514)	-108.950 (748.041)	-0.026 (10.511)
INTL. <sup>2</sup> X I <sub>2</sub> (Transportation)				56.348 (393.072)	-1.009 (11.054)
INTL. X I <sub>3</sub> (Information tech.)			0.154 (0.625)	1.592 (2.127)	3.169 <sup>†</sup> (1.317)
INTL. <sup>2</sup> X I <sub>3</sub> (Information tech.)				-1.441 (2.125)	-2.719 <sup>†</sup> (1.616)
INTL. X I <sub>4</sub> (Business)			-1.350 (0.860)	4.576 (3.530)	5.179** (1.807)
INTL. <sup>2</sup> X I <sub>4</sub> (Business)				-5.739 <sup>†</sup> (3.278)	-6.128** (2.166)
I <sub>2</sub> (Transportation)	-0.183 (0.539)	-0.595 (0.568)	-0.368 (9.948)	51.630 (355.269)	
I <sub>3</sub> (Information tech.)	0.558** (0.214)	0.648** (0.223)	0.628 <sup>†</sup> (0.339)	0.434 (0.448)	

I <sub>4</sub> (Business)	0.446 (0.295)	0.525 <sup>†</sup> (0.306)	1.254* (0.547)	0.207 (0.832)	
year 2006	-0.237 (0.148)	-0.230 (0.144)	-0.230 (0.143)	-0.231 (0.143)	-0.234 (0.143)
year 2007	-0.226 (0.148)	-0.238 (0.145)	-0.244 <sup>†</sup> (0.144)	-0.256 <sup>†</sup> (0.144)	-0.263 <sup>†</sup> (0.144)
year 2008	-0.287 <sup>†</sup> (0.150)	-0.282 <sup>†</sup> (0.147)	-0.282 <sup>†</sup> (0.146)	-0.295* (0.147)	-0.304* (0.146)
year 2009	-0.262 <sup>†</sup> (0.151)	-0.257 <sup>†</sup> (0.148)	-0.271 <sup>†</sup> (0.148)	-0.275 <sup>†</sup> (0.147)	-0.279 <sup>†</sup> (0.147)
Wald X <sup>2</sup>	17.40*	27.72**	31.39**	35.13**	33.80**
Observations	360	360	360	360	360
Number of firms	72	72	72	72	72

a) logarithm of total asset; Industry variable (dummy); year 2005-2009 (dummy)

b) z-statistic in parentheses

<sup>†</sup> p<0.10, \* p<0.05, \*\* p<0.01

To test H1, this study ran regression with the IT service sector alone. Model 1 and Model 2 in [Table3] show both the linear and curvilinear effect of internationalization on ROS for IT service. The results [Table 3] reveal support for our hypothesis 1—a U-shaped relationship (curvilinear effect) between international diversification and firm performance in IT service firms. The coefficient of both INTL. and squared INTL. term have statistical significance at p<0.01. The results imply that increasing the degree of internationalization of IT service firms initially hampers the firm’s total profitability. However, beyond a certain level, the firms’ performance begins to improve.

H2 expects a less distinct negative effect of internationality on performance for IT service firms than others. It means that service—whether IT service or not—will moderate the U-shaped relationship between internationalization and performance. I examine this in Models 3, 4, and 5 in [Table 2], which includes the interaction terms of linear and squared internationalization with industry variables, respectively.

**Table 3:** Information service sectors <sup>a,b)</sup>

VARIABLE	ROS	
	Model 1	Model 2
Constant	-2.591 <sup>†</sup> (1.527)	-2.137 (1.599)
SIZE	0.105 <sup>†</sup> (0.061)	0.101 (0.064)
Internationalization (INTL.)	0.076 (0.296)	-2.700** (0.973)
Internationalization squared (INTL. <sup>2</sup> )		3.265** (1.068)
year 2006	-0.171 (0.151)	-0.165 (0.146)
year 2007	-0.275 <sup>†</sup> (0.152)	-0.261 <sup>†</sup> (0.147)



year 2008	-0.186 (0.153)	-0.160 (0.148)
year 2009	-0.032 (0.155)	-0.032 (0.150)
Wald X <sup>2</sup>	7.40	17.19*
observations	210	210
Number of firms	42	42

a) logarithm of total asset; year 2005-2009 (dummy)

b) z-statistic in parentheses

† p<0.10, \* p<0.05, \*\* p<0.01

Model 3 and 4, which add the interaction terms to Model 2 to examine the moderating effect of industry, do not have the moderating effect of industry. The interaction term between internationalization, squared internationalization, and firm performance is not statistically significant. In other words, no modification in form exists between internationalization and firm performance. As a result, no moderating effect of industry was found on the relationship between internationalization and firm performance.

However, marginally speaking, the interaction term of the IT service industry effect is statistically significant at  $p<0.05$ ,  $p<0.1$ , each linear and curvilinear term. The equation of Model 5 differs from Model 4. Model 4 assumed that the interaction term will modify both intercept and slope of variables. On the other hand, Model 5 has a different assumption that the interaction term will change slope. Given that this paper aimed at exploring the moderating effect in the relationship between internationalization and firm performance, I can say the significance of the interaction terms of the linear and squared term and IT industry effect marginally give evidence to the presence of the moderating effect of the IT service industry. Therefore, H2 has limited support.

## 5. Results

This study examined the relationship between international diversification and firm performance. This research issue has surfaced as a main theme in contemporary international business and strategic management. This paper attempts to examine empirically the relationship between international diversification and performance in service firms. Numerous prior studies have tested the international diversification-performance relationship with samples of manufacturing firms or U.S.-based firms (Capar & Kotabe, 2003).

Thus, this paper argues that the relationship between international diversification and performance in the service industry differs from the traditional manufacturing industry. Capar and Kotabe (2003) asserted a U-shaped curvilinear form for the relationship between international diversification and performance in service firms. This indicates that international diversification may reduce performance up to a certain point because of diseconomies of scale that relate to such expansion. Beyond the threshold point, higher levels of international diversity performance increase because of realized economies of scope. The results of this paper show consistency with those of Capar and Kotabe (2003).

In addition, this paper attempts to distinguish between IT service and other services. The results showed that IT service firms may differ in their U-shaped form, that is, the negative effect of internationality may have weaker results on IT service firms than on other types of service firms. Because the nature of IT reduces some of the initial burden investments the negative effects would be less distinct. Rangan and Sengul (2009) argue that the firms use information technology to mitigate transaction costs and gain benefits from lower production costs. In other words, information technology has reduced asset specificity, aided decentralized coordination, and shifts outward the tradeoff frontier in exchange relating incentive intensity and cooperative adaptation (Rangan & Sengul, 2009). Furthermore, information service likely belongs to the knowledge-based service category. Knowledge-based service firms have a lower tangible capital assets burden as well as clients who were already established. Thus, information services can reap more benefits of international expansion than other service sectors.

The present study also has a number of limitations. First, international diversity is represented by internationalization measuring the ratio of FSTS using export intensive. This represents a controversial issue: that export intensive can be the proxy of international diversification. In addition, the present study measured

internationalization by a single indicator. Ideally, one would have multiple and more elaborate indicators to catch richer international activities of firms. However, constraints in data availability hindered this attempt (Caper & Kotabe, 2003). Despite this problem, some research examines emerging countries, new ventures, and new economy firms using export intensive as a proxy for internationalization or international diversification. Second, a limited number of service industries based in Korea served as the sample for this study. Thus generalizability to other service industries and service firms from other countries must be made with caution. The findings of this study should call for more investigation to this effect.

As a further limitation of this study, it could not contain a number of potential variables related to the relationship between international diversification and performance because of unavailable data. Future research should examine this using other variables as moderator or anterior variable of the international diversification-performance relationship. Although this study examines whether the U-shape relationship between international diversification and performance would apply to other service industries, it showed limited results. Future research may include a larger sample and more appropriate variables and methodology tool.

In conclusion, this paper investigates the relationship between international diversification and performance by using a sample of Korean service firms including IT service. The study found evidence of a U-shaped curvilinear relationship between international diversification and performance. The results are consistent with a number of previous studies (e.g., Capar & Kotabe, 2003; Contractor et al., 2003). Also, this paper suggests a slightly different form of the relationship between international diversification and performance among service industries. Further research will explore more closely the form of the relationship between international diversification and performance in service firms or new ventures.

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