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International Growth Strategies of Service and Manufacturing Firms:
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ABSTRACT

This study furthers research in globalization of services by examining the differences in growth strategies of manufacturing and service firms. We integrate the literature from operations management, strategy management, services marketing, financial management, and international business to build hypotheses regarding the similarities and dissimilarities in the growth strategies of manufacturing and service firms. We use multiple years of secondary data from several sources to test our hypotheses. The results support our contention that indeed service and manufacturing firms view the process of internationalization differently. This differentiated view has implications for the location or internationalization decision of service firms, as a part of either their operations strategy or growth strategy. The data collection methodology applied in this paper is a much needed addition to the research methods portfolio available to operations management researchers.

Key words: service operations, international/global issues, service characteristics, growth strategies, strategic alliances, mergers and acquisitions.

INTRODUCTION

The contribution of the service sector to the Gross National Product (GNP) has increased in both industrialized nations and developing markets (Metters, King-Metters, Pullman, & Walton, 2006), but research efforts in this sector have not kept pace with the growth. The research addressing internationalization of services has been generally lacking. Roth and Menor (2003) underscored the need for "a better understanding of service in a global context", while identifying "boundary-expanding SOM [Service Operations Management] research opportunities". Most researchers accept that services and manufacturing firms are different, and more empirical validation is needed particularly because service characteristics impact strategic operations options and decision making (cf., Contractor, Kundu, & Hsu, 2003; Nie & Kellogg, 1999). We contend that services, such as banks, use different international growth strategies compared to manufacturers, such as chemical firms, due to their distinctive characteristics.

Based on our review of the relevant literature in related fields, such as operations management, strategy management, services marketing, financial management, and international business, we identify several gaps in the literature. First, there is a dearth of empirical studies that have focused on growth strategies of service firms or that have compared differences between the domestic and international growth strategies of service firms. Second, while there are some research efforts that have conceptualized the differences in internationalization activity between manufacturing and service firms (cf., Davis, 2004; Ekeledo & Sivakumar, 1998; Sarathy, 1994), no literature exists that empirically investigates the differences between the two types of firms. Third, while some conceptual and empirical studies have focused on the determinants of internationalization (cf., Erramilli & D'Souza, 1993; Hitt, Bierman, Uhlenbruck, & Shimizu, 2006), few have focused on the distinctive characteristics of goods and services that

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differentiate the internationalization of services from manufacturing (cf., Blomstermo, Sharma, & Sallis, 2006; Erramilli & Rao, 1993). Finally, none of the above mentioned literature draws from the operations management field, with the exception of Elango (2005) that focused on plant characteristics.

We posit that the paucity of empirical work comparing internationalization of services and manufacturing is rooted in the difficulty of obtaining data. Specifically, firm level data have been difficult to obtain, thus many researchers have focused on aggregated industry data (cf., Miller & Parkhe, 1998). We use firm level data to test our assertions regarding growth strategies of the two types of firms. Lastly, we demonstrate that triangulation of data helps us to better understand this growing phenomenon of internationalization by service firms. To examine the differences in international growth strategies of service and manufacturing firms, we chose two representative segments. The following section explains our rationale for these choices.

THE SETTING

OM researchers, such as Chase (1978, 1981) and Chase & Tansik (1983), have suggested that most firms exist on a continuum ranging from pure services to mixed services to pure goods. According to Chase, a key factor that determines the position of a company on the continuum is the level of employee-customer contact. Using the "contact framework," Armistead, Bowman, and Newton (1995) argue that "pure service firms" (e.g. health centers and hair salons) require a higher degree of contact between the firm and the customer whereas "pure manufacturing firms" (e.g. food processors and durable goods manufacturers) entail a lower degree of contact between the firm and the customer. In between the two extremes are "quasi-manufacturing" firms, and "mixed services." The quasi-manufacturing firms, although classified as service firms, require

virtually no face-to-face contact with customer. Mixed services have elements of both—pure service firms and quasi-manufacturing firms.

In this study, we select banks to represent mixed service firms. The front-office in a bank with tellers and loan officers is a high contact service operation, whereas the back-office where check-processing takes place requires no face-to-face customer contact. The choice of banks also presents an appropriate setting for the following reason. The once highly regulated U.S. banking industry witnessed a significant change in its industry environment as it found opportunities to pursue interstate growth as a result of the enactment of the Riegle-Neal Interstate and Branching Efficiency act of 1994. Around the same time, opportunities for international growth opened by way of worldwide deregulation of the banking sector, due, in part, to the enactment of General Agreements on Trade in Services (GATS) during the Uruguay round. GATS enabled both the European Union and U.S. to open their financial markets and reduce the barriers for globalization of financial services. In our assessment, the regulatory changes with regard to both domestic and international expansion in the banking industry were simultaneous, which presented a fair and equal opportunity for domestic as well as international growth. To further avoid any undue impact of deregulation on growth in domestic or international activity, we allowed a cooling-off period of over two years before starting the data collection.

To represent the manufacturing sector we selected chemical firms, which may be typically viewed as goods manufacturers with a very low level of contact between employees of the firm and its customers. Dessouky, Kijowski, and Verma (1999) assert that, while chemical firms are classified as manufacturing firms, they also are required to practice a service component. The service content in chemical firms is, however, lesser as compared to banks. Choosing these two types of firms, mixed service firms and manufacturing firms with some

service component, will allow for a greater level of generalization, as neither is pure service nor pure manufacturing.

<div align="center">**HYPOTHESES**</div>

Growth Activities: Service and Manufacturing Firms

Firms can grow either by increasing the scope of products and/or services offered or by changing the scope of geography in which they provide their products and/or services. Researchers have argued that in the manufacturing process any part of the value chain of the firm (Porter, 1980) that is tradable, non-perishable, and transportable can be de-linked, thus making the process of international growth easier for manufacturing firms. As long as transportation costs and communication costs are low, there is an incentive for a manufacturing firm to consider de-linking of the value chain to gain an advantage (Langlois, 2004).

Service firms find it more challenging to enter international markets due to the characteristics of intangibility, inseparability, variability, and perishability (Kotler & Armstrong, 1994); importance of customer contact based on communication time, intimacy, and information richness (Kellogg & Chase, 1995); and critical factors of labor intensity, degree of customization, and degree of interaction (Haywood-Farmer, 1988). Inseparability of production and consumption of services makes it difficult to export services, such as banking, because inseparability requires direct involvement or the presence of consumers. In the new changed environment some banks may like to consider more active participation in a foreign country, but starting a new facility or creating a joint venture with a foreign bank in a relatively unknown international location requires understanding of the local culture and establishing an image as a quality service provider (Cook et al., 1999). It may also be more demanding to control the interaction between service provider and consumer in international markets because of varying

customer expectations in those markets (Sarathy, 1994) as compared to the familiar domestic markets. Banks would also be attracted to focus on the domestic markets because firms like to replicate administrative practices that have proven to be successful (Verdú, Gómez-Gras, & Volberda, 2006). This is particularly true if service firms, such as banks, face problems entering foreign markets due to non-tariff barriers, lack of cultural skills, and/or the liability of foreignness (Schulz, 2005).

It takes time to build trust and relationships in foreign markets, which are crucial to the success of many services. While Youngdahl, Kellogg, Nie, and Bowen (2003) found that service customers' satisfaction-seeking behavior is not at all culturally oriented, a larger number of researchers have posited otherwise. For example, Lovelock (1996) observed that high levels of customer interaction and/or demand for customization of services require an understanding of the local culture. Thus, inseparability of production and consumption of a service heightens the risk of entering foreign markets, making it quite challenging for service firms to explore international growth opportunities (Sarathy, 1994; Winsted & Patterson, 1998). Unlike chemical firms, banks cannot completely separate their service 'production' from the customers who consume these services (Domke-Damonte, 2000). As banks or other similar service firms plan to expand internationally they will face higher demand variability (Harvey, Lefebvre, & Lefebvre, 1997). To gain international access, firms will have to be flexible in response to cultural and competitive needs of the foreign market (Campbell & Verbeke, 1994). Similarly, due to the features of heterogeneity and perishability, service firms have to be more flexible in servicing the foreign markets (Meijboom & Houtepen, 2002).

Concerning the growth activities, a manufacturing firm will focus on international market development over product development if it can use existing technological know-how and

minimize its sunk costs (Carman & Langeard, 1980). A service firm, however, may prefer domestic market development over new service development if it can use its existing logistics network. Also, successful service innovations are easy to copy as compared to successful product innovations (Carman & Langeard, 1980). This problem is exaggerated in the context of internationalization because most countries provide stronger patent protections to products as compared to services.

> H1: Compared to manufacturers, such as chemical firms, services, such as banks, will focus
> a) _More_ on domestic growth activities.
> b) _Less_ on International growth activities.

Modes of International Growth

The two primary modes of internationalization besides exports include wholly owned operations (acquisitions or greenfields) and collaborative operations (joint ventures or strategic alliances). Wholly owned operations, where the firm maintains ownership control, have been identified as highly risky, especially in terms of expected profits (Lee & Caves, 1998). The choice of entry modes are based on trade-offs between risks and returns. Risks and returns are correlated with ownership because with higher ownership comes a higher level of control and with higher ownership also comes a higher level of risk due to the greater involvement of the firm in decision-making and commitment of resources (Agarwal & Ramaswami, 1992).

Earlier literature focusing on service firms' modes of internationalization placed emphasis on the transaction cost analysis approach (Erramilli, 1990) where the arguments have revolved around identifying conditions under which a service firm may accept shared control or wholly owned control of the operations (Domke-Damonte, 2000). In recent years, researchers have suggested that transaction cost analysis (TCA) has limitations (Andersen, 1997) in explicating the internationalization mode choices. Madhok (1997) used organizational capability (OC) to

examine the issue of wholly owned approaches (acquisitions and greenfield activities) and contrasted them with collaborative approaches (joint ventures and strategic alliances). The OC perspective argues that capabilities allow for and restrict a firm's growth strategy. Firms entering new markets have to assess the need for learning new capabilities required in the new markets. The acquisition of knowledge about a new market and application of this new knowledge could be a slow, gradual, and costly process for a firm, if the requirements for new capabilities in the new markets are very dissimilar (Madhok, 1997) as compared to its present markets.

Ethiraj, Kale, Krishnan, and Singh (2005) link organizational capabilities to the resource based view of the firm. The authors also suggest that a firm's capabilities are context specific and capabilities provide different benefits, while having different costs. Thus, in the context of the present study it may be inferred that service firm capabilities that have served well in the domestic arena need to translate similarly in the international arena. A firm may obtain competitive advantage when a firm combines its know-how (internal knowledge) with the supporting structure that can allow for extracting the benefits of the know-how (Ethiraj et al., 2005).

The knowledge in a firm is broken into either embedded (firm specific) or generic knowledge. When a firm has a high ratio of embedded to generic know-how, its knowledge base would be more firm-specific and thus more difficult to transfer to any other firm (Madhok 1997). If a firm has high degree of embedded knowledge, a collaborative approach (such as licensing) is not an attractive growth strategy to the firm, because the technology would not be as valuable to a licensee as it would be to a licensor. A manufacturing firm with a patent on a product, for example, would prefer wholly owned approaches for internationalization.

The process of learning the local environment does take time (Tschoegl, 1987). For service firms, the issue of control over their operations in a foreign land may be mitigated if they have a good social network in the country that they plan to enter. Alternatively, when a service firm engages in a collaborative activity, it can exercise control without full ownership if it can negotiate alternative control mechanisms, such as veto rights over critical decisions (Blomstermo, Sharma, & Sallis, 2006). Wholly owned international activities face liability of foreignness (Zaheer, 1995) and the need for multiple cultural understanding (Barkema, Bell, & Pennings, 1996), which become a barrier for the investing firms that desire to learn and develop new capabilities (Shimizua, Hitt, Vaidyanath, & Pisano, 2004).

For manufacturers, such as chemical firms, the embedded know-how is critical whereas for services, such as banks, knowledge of the markets is more critical as they need to learn and adapt to the local environment (Cook et al., 1999). Similar to know-how (internal knowledge); market knowledge also could be divided into general (generic) or specific (embedded) knowledge (Madhok 1997). Higher degree of specific (or embedded) market knowledge would require a firm to conduct business in the new country in a way that is very specific to that country. When the embedded knowledge about the market tends to become more specific, the need for customized (non-standard) routines increases too. In the case of services, such as banks, each local market demands that they understand their customers and regulators specific to that market. In such a case, the embedded to generic ratio for market knowledge for banks would be high, while the embedded to generic ratio for internal knowledge (no patents, etc.) would be low and hence such services are more likely to choose collaborative approaches. The collaborative approaches allow services to understand specific aspects of their markets through collaborative partners.

Service firms with a lack of country specific as well as competitive market knowledge concerning a foreign market are likely to perceive greater difficulty to internationalize (Eriksson, Johanson, Majkgard, & Sharma, 1997; Shimizua, Hitt, Vaidyanath, & Pisano, 2004). Carman and Langeard (1980) observed that internationalization is riskier for service firms. If a service firm wishes to internationalize, it may decrease the risk by reducing its ownership exposure (Lee & Caves, 1998) in the new markets and make a trade off between risk and return (Agarwal & Ramaswami, 1992) by choosing a collaborative approach. We surmise that firms will prefer wholly owned approaches to market entry when the knowledge base is difficult and hard to share or teach (Kogut & Zander, 1993). We contend that manufacturers, such as chemical firms, as compared to services, such as banks, are more likely to have knowledge based on internal routines, such as their research and development activities, which are harder to teach and sometimes harder to codify and transfer. Hence, manufacturers would prefer wholly owned operations as compared to services. Thus,

> H2: Compared to manufacturers, such as chemical firms, services, such as banks, will focus
> a) *More* on creating collaborative international activities, such as joint ventures and strategic alliances.
> b) *Less* on creating wholly owned international activities, such as greenfield ventures and mergers and acquisitions.

DATA COLLECTION AND RESEARCH METHODOLOGY

The majority of empirical studies examining service firms' international activities have relied on survey based data due to the difficulties 'in obtaining complete and reliable data from secondary sources' (Ekeledo & Sivakumar, 1998: 286). Realizing the difficulties related with data collection from secondary sources, we collected and triangulated data for our concerned firms from various sources. We chose relatively large firms because based on the eclectic theory of international

business (Dunning, 1989), size is positively related with the internationalization activities (Javalgi, Griffith, & White, 2003).

Our choice of large firms listed in *Fortune* magazine was driven by the rationale that if we are going to find international activities it is more likely to be among larger firms. The April 1998 issue of the magazine listed 39 chemical firms in its *Fortune 500* list and 51 banks. The firms were profiled based on their 1997 activities. Hence these firms became our starting point in the data collection effort. The size based on revenue is as follows. For chemical firms the size went from 10.83 to 39.91 billion US $ and for banks the size in revenue terms in 1997 ranged from 1.05 to 34.70 billion US $. Since the growth strategies were observed for the period 1997-1999, the control variables, such as prior international experience, and size of the firm, were chosen for the prior year, 1996.

International and Domestic Activities by Firms

We collected data on the international as well as domestic activities for our sample firms for three years, 1997 through 1999, for reasons already mentioned in "The Setting" section. In theory, we could have continued to collect data for a few additional years, however, the problem was that many banking firms merged and by the year 2001 about 1/3rd of the starting sample had either been acquired or merged, which would leave us with a very small sample size.

Source of Data

Our database was prepared by combining various secondary sources. As can be seen from Table 1, we use 14 different sources for our independent, dependent, and control variables. We first used the *Fortune 500* list, which was then subjected to news announcements in the *Business and Industry Reports*. The growth activities of our sample firms were culled from this database and analyzed using a content analysis approach. If there were problems with name changes, etc.

"*Hoover's Online*" was used to sort out such problems. Lastly, to complete the data set, including additional control variables, several published sources besides Compustat were utilized. These include, *S&P Industry Surveys, EDGAR* Web site*, America's Corporate Families Volume I and III, Directory of Corporate Affiliations Volume 3, Ward's Business Directory of U.S. Private and Public Companies,* FDIC Web site*,* and *Thomson Financial* database.

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Insert Table 1 here

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Using *RDS Business and Industry Reports*, we analyzed the news announcements concerning the chemical firms and banking firms in our sample (90 firms in total) for the years 1997-1999. We focused on obtaining factual information, not planned activities or rumored activities, from the news items listed on the RDS database. The activities of each firm, international or domestic, were put into an Excel sheet that provided specific information, such as, domestic vs. foreign activities, choice of mode of entry, etc.

Control Variables

We collected data on control variables as follows. Prior net income, as a measure of past performance, was primarily collected from a database called "*Research Insight*," formerly known as "*Compustat.*" We started collecting data for our sample firms in 2004. Many of the firms in our sample were by then acquired or merged and hence they were not actively traded on the stock exchanges. The *Research Insight* database is difficult to navigate when ticker symbols are not active. For such firms, we collected data from the "*S & P Industry Surveys.*" When it was difficult to track firms in either of the above mentioned databases due to name changes, etc., *Hoover's Online* was used. When all else failed, we visited the "*EDGAR*" Web site maintained by the SEC

and obtained net income details from the annual performance reports (10-K Forms) submitted by the firm to the SEC for the years under consideration.

To check the potential of industry concentration in our sample, we calculated the Herfindahl measure as the sum of squared percent of operating revenue of each participating firm based on 1996 data that was obtained from the same data sources as for the net income. The denominator, total industry revenue for the chemical industry, was obtained from the "*Ward's Business Directory of U.S. Private and Public Companies*." The denominator for the banking industry was obtained from the *Federal Deposit Insurance Corporation,* where all U.S. banks have to report their financials. The measure was used to compare industry concentration in the two samples. The measure was later transformed into a related control measure but at the firm level (RELREV), expressed as operating revenue relative to the total industry revenue, which accounts for the relative size of the firm in our sample.

The second control variable was the prior international experience. It was operationalized as the ratio of a firm's foreign subsidiaries to total (foreign + domestic) subsidiaries of the firm in the year 1996. Most of the data for domestic subsidiaries up to 1996 were obtained from *America's Corporate Families Volume I*. The international subsidiaries up to 1996 were obtained from the related publication titled *America's Corporate Families and International Affiliates Volume III*. At times the data were missing in these publications and additional data for international subsidiaries up to 1996 were obtained from the *Directory of Corporate Affiliations Volume 3*. When these sources did not provide required information, we used *Moody's Bank and Finance Manual*. The third control variable was the size of the firm, operationalized as the number of employees. The data for this measure was obtained from *America's Corporate Families Volume I*.

Data Analyses

We applied multivariate analysis of variance (MANOVA) technique using the General Linear

Model Multivariate (GLMM) procedure in SPSS 11.5 for Windows. MANOVA was conducted as

a two-step process. In the first step, we tested the overall hypotheses of no differences in the means

for the different groups. If the overall test was found significant based on the multivariate analysis

of variance, the second step involved follow-up analyses to explain group differences.

The two dependent variables used simultaneously in GLMM for testing hypotheses H1a

and H1b were the domestic and international growth activity over a three-year period. The two

dependent variables used for testing H2a and H2b were the mean scores based on the type of

international modes of entry identified as collaborative or wholly owned. The two GLMM

models used are shown below. The firm type (FRMTYPE), as either bank or chemical, was used

as a factor variable in both models as shown in the equations below:

$$\{(DOMCOL+DOMWO), (INTCOL+INTWO)\} = f (LNEMP96, RELREV, FRMTYPE) \dots(1)$$

$$(PINTCOL, PINTWO) = f (LNEMP96, RELREV, PFRNSUB, FRMTYPE) \dots\dots\dots\dots(2)$$

Where:
DOMCOL –   Domestic collaborative activity (Alliances and Joint Ventures)
DOMWO –   Domestic wholly owned activity (Mergers and Acquisitions, and Greenfields)
INTCOL –   International collaborative activity (Alliances and Joint Ventures)
INTWO –   International wholly owned activity (Mergers and Acquisitions, and Greenfields)
LNEMP –   Natural log of #employees in 1996
RELREV –   Relative revenue
PFRNSUB –   Proportion of foreign subsidiaries to total (Past International Experience)
FRMTYPE –   Type of firm: Bank or Chemical
PINTCOL –   International collaborative activity as proportion of total international activity
PINTWO –   International wholly owned activity as proportion of total international activity.

The first GLMM model in equation (1) for testing H1a and H1b used two control

variables as covariates, whereas the second model in equation (2) for testing H2a and H2b used

an additional third variable. Two common control variables were relative revenue (RELREV) and

another measure of size, operationalized as the natural log of employees in 1996 (LNEMP). The

logarithmic transformation was used to remove any skewness in the distribution. The second model used prior internationalization experience, operationalized as proportion of foreign to total subsidiaries (PFRNSUB) up until 1996, as an additional control variable. The fixed factor variable, firm type, used as a proxy for the presence or absence of service characteristics was operationalized as a binary variable.

The Herfindahl index, as defined in the previous section, can range from 0 to 10,000. For our sample, it was 142 for firms in the chemical industry and 146 for those in the banking industry. The relatively low, and nearly equal, indexes for the two samples suggest low industry concentration, which implies relatively high degree of competition among sample firms in their respective industries. We developed a related control measure but at the firm level (RELREV), expressed as operating revenue relative to the total industry revenue, which accounts for the relative size of the firm in our sample.

RESULTS

The descriptive statistics and inter-correlations among study variables for both banks and chemical firms are presented in Table 2. The key assumptions for the use of MANOVA, i.e., normality, homogeneity of variances and covariances, and independence, were tested and successfully met. The MANOVA results and post-hoc univariate analyses of variance (ANOVA) with parameter estimates produced by GLMM for comparisons of domestic and international growth activity between goods producers (chemical firms) and service providers (banks) are presented in Table 3. The four commonly used multivariate statistics (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root) for the fixed factor of interest, inherent characteristics of an operation captured via firm type as a bank or a chemical firm, are all significant ($F_{<2,84>} = 17.218$, *p-value < 0.0001*). This factor also explains a significant

proportion of variance (*partial eta-squared 0.291*) in the overall model with a very high observed power equal to 1.00, computed using 5% alpha.

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Insert Tables 2 and 3 here
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The post-hoc tests of between-subjects effects were significant for both dependent variables, international growth activity ($F_{<3,85>}$ = *30.698, p-value < 0.0001*) and domestic growth activity ($F_{<3,85>}$ = *16.388, p-value < 0.0001*). One of the control variables, relative revenue, was significant in both post-hoc ANOVA models for the two dependent variables. The second control variable, firm size, was moderately significant (*beta = -1.818, p < 0.10*) in the case of comparative international growth activity only, but with an unexpected negative sign. This result is further discussed in the next section.

The fixed factor, firm type, was significant in both post-hoc ANOVA models. Based on the parameter estimates provided by GLMM, a negative coefficient for the categorical factor representing chemical firms (beta = -3.436, p < 0.01) for the three-year domestic activity suggests that the chemical firms are significantly less likely to engage in domestic growth as compared to banks. On the other hand, a positive coefficient for the same factor (beta = 4.845, p < 0.01) for the three-year international activity suggests that they are significantly more likely to engage in international growth. Thus, both Hypotheses H1a and H1b are supported.

As a corollary of H1a and H1b, the within industry comparisons of the three-year aggregate domestic and international growth activity suggest that banks focus more on domestic growth (mean = 8.274, std. error = 0.917) rather than international growth (mean = 2.667, std. error = 1.223). The mean difference is found to be significant (*t = 5.237, p < 0.001*). Further, chemical firms seem to focus more on international growth (mean = 7.923, std. error = 1.709)

than domestic growth (mean = 5.026, std. error = 0.962). Again, the mean difference is significant ($t = -2.952, p < 0.01$).

Hypotheses H2a and H2b were also tested using MANOVA, followed by ANOVA and post hoc tests of proportions for the two populations - banks and chemicals firms. The four commonly used multivariate statistics (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root) for the fixed factor of interest, inherent characteristics of an operation captured via firm type as a bank or a chemical firm, were all significant ($F_{<1,52>} = 4.967, p\text{-value} < 0.05$). As shown in Table 4, none of the control variables were significant, but the fixed factor explained a statistically significant proportion of variance in the two types of modes of entry (*partial eta-squared 0.087*) with an observed power equal to 0.59, computed using 5% alpha. The lack of significance for the controls and reduced power for the second set of hypotheses may be due to smaller effective sample size for this test (n=57) as fewer banks engaged in international growth activity.

Insert Table 4 here

The post-hoc tests of between-subjects effects were significant for both dependent variables, international collaborative activity and international wholly owned activity ($F_{<1,52>} = 4.967, p\text{-value} < 0.05$). The subsequent results, based on the parameter estimates provided by GLMM, suggest that chemical firms are significantly less likely to choose collaborative modes for international expansion as compared to banks (*t-statistic = -2.229, p-value < 0.05*). Since the two dependent variables are operationalized as proportions, which are complementary, the above result supports Hypothesis H2a that banks choose collaborative modes more than the chemical firms. Due to the complementarities of proportions explained earlier, the parameter estimates of

the other model with proportion wholly owned as the dependent variable are exactly the same with two exceptions. First, the magnitude of the intercept coefficient equals 0.584. Second, the sign for the categorical variable is reversed, which supports Hypothesis H2b in that chemical firms engage in more wholly owned international activities than banks.

It may be noted that the degrees of freedom for this test are fewer because not all firms, mainly banks, had international growth activity in the three years of study, 1997-99. Further, a post-hoc analysis of proportions revealed that about 72% of the banks that are seeking international growth have engaged in collaborative ventures as compared to 44% of the chemical firms in the same category. Likewise, 27% of the banks pursuing international growth have wholly owned ventures as compared to 55% of the chemical firms. These relative proportions lend further support in favor of Hypotheses H2a and H2b at *p <0.0001* (*Z = ±5.83*). These results are further discussed in the next section.

DISCUSSION

In this study, using banking firms and chemical firms as representatives of mixed service providers and goods producers (with a service component) respectively, we provide a comparison of their international growth strategies, including the choice of mode of entry. Using secondary data in an innovative way, we find that mixed services, such as banks, indeed focus more on domestic growth activities and less on international growth activities. On the other hand, manufacturers with a service component, such as chemical firms, focus more on international activities as compared to domestic activities. On further investigation we noted that the chemical firms in our sample had 52% of the total subsidiaries as foreign subsidiaries, whereas the banks had a mere 10%. Further, we observed that prior international experience was not correlated with the international growth strategies of chemical firms, but it was in the case of banks.

We observed a very high correlation between the two international growth strategies in the case of banking firms. This indicates that banking firms that internationalize using a wholly owned strategy also use collaborative approaches. When further examining the modes of international expansion for banks, we found (as expected) a significant number of banks had no international activity. Hence, when we correlate the international collaborative and international wholly owned activities for banks, we find that the resultant high correlation coefficient is influenced by the fact that a significant number of banks do neither. Another related observation that does not directly affect our hypotheses is a high inter-correlation between international and domestic collaborative activity for the chemical firms in our sample. This observation may be explained under the transactional cost approach whereby some companies base their growth decisions on a risk/return basis and may uniformly prefer one approach, such as collaborative, to minimize their risk regardless of the geographic scope of their decision.

In the case of international growth, we also noticed that firm size as measured by the natural log of the number of employees had a negative impact. Contrary to the conventional wisdom that U.S. based firms that are more labor intensive would tend to internationalize more, the negative sign seems to refute that notion. This result lends indirect support to our thesis in the current study that the internationalization decision when compared between goods producers and service providers is rather influenced by other factors, such as the inherent distinctive characteristics of an operation. Alternatively, it is possible that the result is confounded by factors related to the firm size, such as increases in operating revenue via productivity improvements and/or technological advancements, which may require less labor content. It is also possible that the firms in our sample, especially chemical, may not be particularly labor intensive, if labor intensity is measured as the ratio of operating labor cost to the total operating

costs or the total value of output produced. It is also plausible that relatively large firms in our sample have already expanded internationally to a point and the smaller firms have more room to grow and are pursuing more internationalization. Nevertheless, we statistically control for this influence in our analyses.

We found significant differences between manufacturing and service firms' choice of mode of entry in a foreign market. We found statistical support for our hypothesis that banks, a type of mixed service firms, preferred collaborative approaches, whereas chemical firms, a type of goods producers, preferred wholly owned ventures. On further inquiry we noticed, albeit contrary to our expectation, a large percentage (44%) of chemical firms in our sample sought international growth via collaborative approaches. Likewise, 27 percent of banks in the sample used wholly owned approaches instead of the hypothesized collaborative approaches. We pondered why these deviant firms did not follow the majority and if there were any performance consequences for such behavior.

Post-hoc Performance Analysis and Related Discussion

First, we examined the performance consequences for deviant behavior, if any. Since the international activity was observed in the 1997-99 period, we decided to collect performance data on foreign income for the following year (i.e., 2000). The foreign income measure was chosen because it is solely based on international activity, which is the basis of comparison. We divided sample firms within each category into two non-overlapping subgroups—those adopting exclusively collaborative approaches or wholly owned approaches for international expansion. Surprisingly, a third subgroup with a significant number of firms emerged that used both approaches. In the case of chemical firms, we were able to collect secondary performance data for 24 firms that had engaged in international growth activity in the period of study. Of these,

five firms each had adopted either collaborative or wholly owned approach, whereas 14 did both. An analysis of variance revealed no significant performance differences among the three subgroups ($F = 1.015$, p-value $= 0.380$). Though the performance data is not sufficient to provide a conclusion, it appears the deviant firms did not incur any performance penalty.

In the absence of any apparent performance consequences, another plausible explanation for deviation from our expectations, especially in the case of chemical firms, could be that these firms may not be pure goods producer and may perhaps be required to practice a service component as contemplated earlier in the paper. It is also possible that certain countries may require some chemical plants of national strategic importance to be created on the basis of joint ventures and not wholly owned foreign activities, as we hypothesized. Unfortunately, it is beyond the scope of the present study to test these assertions due to data limitations. Alternatively, it may be argued that the performance impact of the strategy, in the case of internationalization may take longer to manifest.

In the case of banking firms, due to a small initial sample, subsequent mergers and acquisitions in the industry, missing performance data, and further classification into three subgroups, we did not have enough firms to make any meaningful performance comparison. In light of the additional analysis for chemical firms and aforementioned reasons, the original results regarding the mode of entry should be viewed with caution and should be subject to further validation in future research.

CONCLUSION AND IMPLICATIONS

Managerial Implications

The findings of this study are relevant for developing operations strategy for both manufacturing and service firms as different nations become a part of the global village. This finding is

particularly relevant when both manufacturing and service firms consider location alternatives as part of their operations strategy or growth strategy. In the case of manufacturing firms, such as chemical firms, the decision is often driven by operating costs, among other factors, in international locations. In the case of services, such as banks, the findings of the study may be helpful in guiding managers in their decisions regarding mode of entry most suitable for their type of service operation.

It has been emphasized that functional strategies, such as the OM strategy, should align with the overall corporate strategy. The fit or alignment is important in formulating strategies as well as in their implementation. Particularly, vertical alignment requires the configuration of strategies, objectives, action plans, and decisions that are consistent across various hierarchical levels of the organization (Kathuria, Joshi, and Porth, 2007). In the case of internationalization, operations managers would be involved in executing the strategy, which may involve setting up a collaborative or wholly owned venture.

Many OM studies have called for research in the service operations field to transcend functional boundaries (Karmarkar, 1996; Roth and Menor, 2003). This cross-functionality may draw on many disciplines, including organizational theory, marketing, psychology, strategic management, information systems, and economics (Boudreau, Wallace, McClain, and Thomas, 2003; Bowen and Hallowell, 2002; Hill, Collier, Froehle, Goodale, Metters and Verma, 2002; Johnston, 1999; Schneider, 1994). While service operations are focusing on global aspects, researchers have found that one of the main barriers towards internationalization as in the operations field is the lack of a 'global view' on the part of managers (Klassen and Whybark, 1994). This cross-functional study is an effort to provide a global understanding to operations

managers concerning the process of service internationalization by integrating literatures from multiple disciplines.

Our results suggest that service firms should opt for collaborative modes of entry rather than the wholly owned. To overcome related challenges due to customer inputs in the service delivery process in a foreign land, service managers should prepare to embrace the host country culture and customs quickly and efficiently. Such considerations are important to manage the efficiency issues as well as complexities and risks involved in foreign operations.

Theoretical Implications

Theoretical contributions of our findings are threefold. First, in the internationalization research across multiple disciplines, while the choice of mode of entry is considered vital, we found no specific studies that compared the choices in the mode of entry for service and manufacturing firms using longitudinal data. We used extant literature and advanced the arguments based on this empirical analysis that service firms, such as banks, due to their distinctive characteristics of inseparability, intangibility, variability, and perishability, prefer a different mode of entry into a foreign market than manufacturing firms.

Second, we address one of the critical problems faced in conducting empirical comparative research on internationalization of services and manufacturing. The paucity of relevant data seems to have limited the focus to conceptual research rather than empirical. For instance, in a review paper, Prasad, Babbar, and Motwani (2001) found that of the 92 papers dealing with international operations strategy 36% were focused on conceptual issues. Even among the 64% empirical papers on international operations strategy, very few used longitudinal data. We used three consecutive years of secondary data from various sources and triangulated them to overcome the increasing scarcity and limitations of self-reported data.

The data collection methodology applied in the present paper may also be applicable to many other topics of operations management. For example, it could be applied to study a link between manufacturing strategy and business strategy, where published data on business strategies could be used in conjunction with primary data on perceptions of manufacturing strategy. Alternatively, secondary data concerning announcements of recalls and quality defects could be collected from the sources used in this study, and be used either independently or in combination with perceptual data collected from shop floor personnel, for quality management research in the operations field.

Additionally, based on the findings of the present study, it is likely that future researchers may examine more fine-tuned research questions. For example, future researchers may examine different internationalization aspects of services, such as banks, from front and back office perspectives. This will lead to the development of more evolved internationalization literature in the operations management field. Another potential area of research would be to compare representative firms from information-processing, possession-processing, and people-processing services in their choices of mode of entry and the performance differences among the three types of service firms. Building a grand, high level abstraction theory in this stream would require multiple studies of both the theory-building and theory-testing nature.

Limitations

While we assert the contributions of our study, we are also cognizant of a few limitations. First, the dependent variables used in the study were based on the number of domestic and international activities, rather than the value of transactions since they were not available for a majority of the news announcements. We conducted extra analysis to conclude that the lack of

monetary value of each transaction does not severely hamper our analysis when we use the number of activities.

Second, when examining modes of entry we noticed a sizeable proportion of chemical firms and a smaller proportion of banking firms that did not behave per our theoretical arguments. To gain further insights to such discrepancies, we examined the performance differences. Unfortunately, we did not get sufficient data points over three years to measure such differences. Hence, the findings of the study should be interpreted and generalized to other service and manufacturing firms with caution.

The generalizability of the findings could also be limited due to the nature of our sample, banking and chemical firms. It may be difficult to generalize results to manufacturing firms with greater service component than chemical firms, and to service firms with less customer contact than banks. In both of these cases, the differences in the distinctive characteristics in the sample of firms in our study could be narrower, which might reduce the magnitude of difference. Future research is warranted to validate the results of the study in other service industries, particularly those with different characteristics than banking.

Conclusion

The location or internationalization decision of service firms, as a part of either their operations strategy or growth strategy, is likely to be different from that of manufacturing firms. As service firms gain greater importance in economies worldwide, it becomes critical that academic literature address several low abstraction level empirical questions leading to a complete theory of service internationalization.

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Table 1: Sources of data.

Data Item	Source	Description	Time Frame
Domestic and international growth activities	*RDS* (Responsive Database Services) *Business and Industry Reports*.	A digital database published by Thomson-Gale, based in Farmington Hills, Michigan; a subsidiary of Thomson Financial.	Jan. 01 1997 – Dec. 31 1999
Past Performance, Operating Revenue, and Performance	1. *Research Insight*, formerly known as "*Compustat.*	A Standard & Poor's (a division of The McGraw-Hill Companies, Inc) publication. For firms actively in operation at the time of data collection.	1996-2000
	2. *S & P Industry Surveys*	Published in hard copy by Standard & Poor's. For firms acquired or merged between 2000 and 2004 with inactive stock ticker symbols.	1996-2000
	3. *Hoover's Online* (http://www.hoovers.com)	A subsidiary of Dun and Bradstreet Corporation, Short Hills, NJ. For firms active in 2004, but had changed their names.	1996-2000
	4. *EDGAR* Web site (http://www.sec.gov/edgar.shtml)	Maintained by the Securities and Exchange Commission (SEC). Used to get net income details from the 10-k forms submitted by the firm to SEC; For firms not found in any other data base.	1996-2000
Total Industry Size for the Banking Sector	FDIC (Federal Deposit Insurance Corporation, http://www.fdic.gov/)	Required to calculate the denominator of the Herfindahl measure of industry concentration.	1996
Total Industry Size for the Chemical Sector	*Ward's Business Directory of U.S. Private and Public Companies*	Published by Gale Research, Detroit, based in Farmington Hills, Michigan, a subsidiary of Thomson Financial. Required to calculate the denominator of the Herfindahl measure of industry concentration.	1996
Number of foreign subsidiaries	1. *America's Corporate Families and International Affiliates Volume III*	Published by Dun and Bradstreet. Required as part of the calculation for Prior International Experience.	1996
	2. *Directory of Corporate Affiliations Volume 3*	Published by National Register Publishing, a division of Reed Elsveer, Inc. New Providence, NJ. Used in the event that the first source did not have the data.	1996
	3. *Moody's Bank and Finance Manual*	Published by Moody's Investors Service, New York. Used if the second source did not have the data	1996
	4. *America's Corporate Families Volume I*	Published by Dun and Bradstreet. Required to create the denominator for the proportion of foreign subsidiaries, a measure of Prior International Experience.	1996
Firm Size	*America's Corporate Families Volume I*	Published by Dun and Bradstreet. The variable was operationalized using the number of employees.	1996
Sample Firms	*FORTUNE* magazine	The April 1998 issue of the magazine listed 39 chemical firms and 51 banks in its "Fortune 500" list. The firms were profiled based on their 1997 activities.	1997 -1999

Table 2: Descriptive statistics and inter-correlations - banks and chemical firms.

	Mean (S.D.)	DOMWO	INTCOL	INTWO	RELREV	LNEMP	PFRNSUB
DOMCOL-Chem -Banks	2.90 (4.87) 2.49 (4.09)	0.39* 0.06	0.91*** 0.82**	0.56** 0.67**	0.79*** 0.70**	0.55*** 0.56**	-0.03 0.45**
DOMWO-Chem -Banks	2.13 (2. 10) 5.78 (4.86)		0.40* 0.06	0.54** 0.04	0.31* -0.03	0.14 0.06	-0.01 -0.27*
INTCOL-Chem -Banks	4.44 (8.07) 1.84 (6.12)			0.63** 0.92**	0.77** 0.64**	0.56** 0.37**	0.05 0.60**
INTWO-Chem -Banks	3.49 (3.57) 0.82 (2.79)				0.51** 0.53**	0.48** 0.25†	0.16 0.56**
RELREV-Chem -Banks	0.01 (0.02) 0.01 (0.01)					0.67** 0.85**	-0.15 0.56**
LNEMP-Chem -Banks	9.15 (0.86) 9.51 (0.87)						0.14 0.32*
PFRNSUB-Chem -Banks	0.52 (0.21) 0.10 (0.18)						1.00

N= 39 Chemical firms and 51 Banks
All p-values are 2-tailed
*** p-value $\leq$ 0.001   ** p-value $\leq$ 0.01   * p-value $\leq$ 0.05   † p-value $\leq$ 0.10

LEGEND:
S.D. – Standard Deviation;
Chem – Chemical firms
DOMCOL – Domestic collaborative (Alliances and Joint Ventures);
DOMWO – Domestic wholly owned (Mergers and Acquisitions, and Greenfields)
INTCOL – International collaborative (Alliances and Joint Ventures);
INTWO – International wholly owned (Mergers and Acquisitions, and Greenfields)
RELREV – Relative revenue;
LNEMP – Natural Log of #Employees in 1996;
PFRNSUB – Proportion of foreign subsidiaries to total.

Table 3: Multivariate analysis of variance for comparative growth between goods producers and service providers.

Dependent Variables: Domestic Growth and International Growth
Multivariate Statistics

Effect	Wilks' Lambda	F	df	Significance (2-tailed)	Partial Eta^2	Observed Power
Intercept	0.974	1.121	2, 84	0.331	0.026	0.241
Relative Revenue	**0.636**	**24.046**	**2, 84**	**0.000**	**0.364**	**1.000**
Size (Log$_n$ Employees 1996)	0.979	0.921	2, 84	0.402	0.021	0.204
Firm Type – Bank/Chemical	**0.709**	**17.218**	**2, 84**	**0.000**	**0.291**	**1.000**

Parameter Estimates

Parameter	Dependent Variable	Coefficient	Standard Error	t-statistic	Significance (1-tailed)
Intercept	DOM97-99[a]	12.393	9.085	1.364	0.088
	INTL97-99[b]	13.909	12.083	1.151	0.127
Relative Revenue	**DOM97-99**	**284.385**	**60.351**	**4.712**	**0.000**
	INTL97-99	**544.778**	**80.261**	**6.788**	**0.000**
Size	DOM97-99	-0.765	1.004	-0.762	0.224
	INTL97-99	-1.818	1.336	-1.361	0.088
Firm Type-Chemical[c]	**DOM97-99**	**-3.436**	**1.184**	**-2.902**	**0.002**
	INTL97-99	**4.845**	**1.575**	**3.077**	**0.001**

DOM97-99: Domestic Growth 1997-1999; INTL97-99: International Growth 1997-1999
a. Overall model F-statistic = 16.388, p <0.0001, df = (3,85), Observed power = 1.00, R^2 = 0.366 (Adjusted R^2 = 0.344).
b. Overall model F-statistic = 30.698, p <0.0001, df = (3,85), Observed power = 1.00, R^2 = 0.520 (Adjusted R^2 = 0.503).
c. Firm Type–Bank parameter is set to zero because it is redundant.
Statistically significant entries are in **bold**.

Table 4: Multivariate analysis of variance for comparative modes of international growth by goods producers and service providers.

Dependent Variables: Collaborative and Wholly owned modes of entry
Multivariate Statistics

Effect	Wilks' Lambda	F	df	Significance (2-tailed)	Partial Eta^2	Observed Power
Intercept	0.997	0.162	1, 52	0.689	0.003	0.068
Relative Revenue	0.974	1.402	1, 52	0.242	0.026	0.213
Size (Log$_n$ Employees 1996)	0.999	0.071	1, 52	0.790	0.001	0.058
Prior International Experience	0.994	0.329	1, 52	0.569	0.006	0.087
Firm Type –Bank/Chemical	**0.913**	**4.967**	**1, 52**	**0.030**	**0.087**	**0.590**

Parameter Estimates   (Dependent variable - collaborative mode as a proportion of the total international growth activity*)

Parameter	Coefficient	Standard Error	t-statistic	Significance (1-tailed)
Intercept	0.416	0.715	0.581	0.282
Relative Revenue	4.776	4.034	1.184	0.121
Size	0.021	0.077	0.267	0.395
Prior International Experience	0.118	0.205	0.574	0.284
Firm Type -Chemical^c	**-0.274**	**0.123**	**-2.229**	**0.015**

Overall model F-Statistic = 3.477, p <0.05, df = (4,52), Observed power = 0.827, R Squared = 0.211 (Adjusted R^2 = 0.150).
c. Firm Type–Bank parameter is set to zero because it is redundant.
* Since the two modes of international growth are operationalized as proportions, they are complementary (Proportion collaborative = 1 - Proportion wholly owned). As a result, the parameter estimates of the other model with Proportion wholly owned as the dependent variable are exactly the same as in above, with two exceptions: a) the intercept coefficient = 0.584 (p-value = 0.209), and b) sign of the dummy variable coefficient is reversed, as expected.
Statistically significant entries are in **bold**.