

9-30-2010

# U.S.-Based Fast-Food Restaurants: Factors Influencing the International Expansion of Franchise Systems

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## Published In

This is an Author's Original Manuscript of an article published by Taylor & Francis Group in Journal of Marketing Channels on Oct 30th 2010, available online: <http://www.tandfonline.com/10.1080/1046669X.2010.512861>

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**U.S.-Based Fast-Food Restaurants:  
Factors Influencing the International Expansion of Franchise Systems**

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**Ni's research was supported in part by Grant DMS-0805409 from National Science Foundation. Address correspondence to Ilan Alon.**

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**Abstract**

Studies of international franchising are scant, but increasing, and can be divided into two streams of research: those focusing on environmental predictors of internationalization and those focusing on strategic, firm-level characteristics. Examining the latter category, this study empirically explores a set of firm-level attributes as predictors of decision-making on whether or not firms seek international expansion. Using longitudinal data from *Bond's Franchise Guide 2001-2008*, we draw on a sample of U.S.-based fast-food franchise systems to test our hypotheses. Specifically, our database is comprised of 1,058 observations of 158 chains and we estimate a semi-parametric logistic model for international franchising. The model contributes to the literature by being the first to examine the *nonlinearity* of international franchising determinants using agency theory. The results show that (1) bonding, (2) the percentage of franchised units, (3) the number of states within which the system operates, and (4) the provision of area development agreements and sub-franchising significantly contribute to the international expansion of U.S.-based fast-food franchisors.

# **U.S.-Based Fast-Food Restaurants: Factors Influencing the International Expansion of Franchise Systems**

## **Introduction**

Decision by franchisors to go global have attracted increasing interest to both practitioners and academics since the takeoff in the 1990s of international franchising (Alon, 1999), in part as a perceived saturation of the domestic marketplace. Fast-food U.S. franchisors like McDonald's, Subway, Burger King, and others have led the way in internationalization and as a result their systems have grown dramatically. For example, almost 6 percent of the sales revenue of McDonald's is generated from its overseas operations. Most major franchisors today are seeking international franchisees (Alon, 2010). Dant, Perrigot, and Cliquet (2008) report that 68.74 percent of U.S. franchise chains operate internationally.

Two theoretical streams have dominated explanations of franchising (both domestically and internationally): agency theory and resource-based theory (Alon, 2006a). Agency theory is one of the primary explanations in the literature. "An agency relationship is present whenever one party (the principal) depends on another party (the agent) to undertake some action on the principal's behalf (Bergen, Dutta, & Walker, 1992, p. 1). In the case of franchising, the franchisor is the principal and the franchisee is the agent. Agency theorists assume that organizations want to minimize the costs of organizational governance, "the costs of aligning the incentives of principals and agents,

including bonding and monitoring” (Norton, 1988, p. 202) and they propose that franchise contracts achieve these goals.

Agency theory presents the counterpoint to the resource constraints theoretic perspective on franchising, especially the related dark prediction of ownership redirection proposed by Oxenfeldt and Kelly (1969) who suggest that since franchise relationships are crafted by franchisors to quickly garner scarce resources from franchisees, once the systems mature and become resource flush, they will no longer need their franchisee partners (see Baker & Dant [2008] for a detailed historical account of this premise). Agency theory suggests that franchising will thrive over time (as agency costs rise), whereas resource scarcity predicts the opposite -- that franchising will disappear as the resources of the company develop.

Despite the contradictory predictions of the agency and resource-scarcity theories regarding franchising, there is a tendency in the literature to combine agency theory with other theories, primarily resource scarcity, to come up with holistic explanations of franchising (e.g., Combs, Michael, & Castrogiovanni, 2004; Tracey & Jarvis, 2007). Castrogiovanni, Combs, and Justis (2006b), for example, show that resource-scarcity considerations are more important when a firm is young, but agency explanations tend to dominate later in the lifecycle of the franchise as it matures to create a cubic relation between age and the proportion of franchises. Castrogiovanni et al. (2006a) recommend a move from resource-scarcity to resource-based approaches to understand franchising because resources should be defined more broadly to encapsulate the full range of services that are required for expansion by a franchisor.

In the international franchising literature, authors also combine resource-based and agency theoretic perspectives to develop explanations of franchising globalization. Based on Huszagh et al. (1992) and Shane (1996a), Alon (1999), for example, shows that franchising internationalization is based on resource-based factors, such as size, age, and growth rate, as well as agency factors, such as royalties, fees, and dispersion. Previous studies, however, are limited because they only examine linear or log-linear trends with fixed coefficients, focusing only on the sign of the coefficient and its statistical significance.

However, by nature the dynamic reality of international franchising is not necessarily linear or log-linear. For example, firms often have to reach a critical size before venturing abroad and they may become less adventurous internationally after they reach a certain level of experience and scale. Johnson and Alon (2005) show that franchisors can be divided into different classes with varying degrees of internationalization. Similarly, in the domestic context, Combs, Ketchen, and Hoover (2004) find that placing franchises into strategic groups better explains the relationship between franchising and performance. Strategic groups influenced by resource scarcity perform less well. These findings suggest that there are limitations to traditional linear empirical approaches to modeling franchising.

Given the two theoretic approaches in the literature on franchising, we hypothesize that the relationship between age and internationalization and investment and internationalization will follow a u-shape. In the initial stages of franchising development, franchisors focus on building their system and they do this mostly through domestic franchising (Castrogiovanni et al., 2006a). At this stage, resource-scarcity

considerations dominate. Over time, however, as the franchisor matures agency factors become more relevant (Castrogiovanni et al., 2006a). In an international context, agency costs are especially high since monitoring is more difficult across space, culture, and institutional environment. We thus predict that when a franchisor reaches a certain age, it will be more likely to internationalize by seeking international franchisees in foreign markets.

Given the limited nature of the previous empirical studies on international franchising, this study singularly contributes to the literature by examining the dynamic nature of international franchising using semi-parametric modeling for the logistic regression. This technique allows us to examine the non-linearity of the data over time. Research by Combs, Ketchen, & Hoover (2004) and Castrogiovanni et al. (2006b) finds non-linear trends in the predictor variables of franchising performance and ownership. Their nonlinear models provide an opportunity to partially resolve the theoretical contradictions between resource-scarcity and agency theory.

Here, the contribution of a predictor factor or a pair of factors can assume any continuous function. Essentially, we partition the explanatory variables into the parametric group and the nonparametric group, where the contributions from the first group (including the dummy variables) are linear, and those from the second group are estimated via penalized splines (Ruppert, Wand, & Carroll, 2003). Using this analytical strategy, using a variety of predictors that were previously established in the literature, we are better able to show how franchisors reach the decision to internationalize. We employ a longitudinal dataset spanning eight years (2001 to 2008), comprised of 1,058 observations and across 158 U.S.-based fast-food franchise chains to test our model.

The remainder of the paper is organized as follows. We begin by developing a theoretical framework, mainly based on agency theory, to identify a series of firm-specific strategic factors; we subsequently estimate their contributions to the decision to expand internationally. Agency theory has been frequently used to explain the emergence of franchising. Some of the explanations for the internationalization of franchising systems using agency theory were originally developed by Shane (1996a) and extended by others (e.g., Alon, 2006a). The paper concludes with a series of implications for future researchers and franchisors.

### **Agency Theoretic Explanations of International Franchising**

A meta-analysis of the franchising literature by Combs and Ketchen (2003) reveals that hypotheses grounded in agency theory perform better than hypotheses grounded in resource scarcity. In franchising, agency theory is also used to model financial returns (Obi, 2005; Brewer, 2003), the proportion of franchising (Alon, 2001; Seshadri, 2002; Pfister et al., 2006; Castrogiovanni et al., 2006B) contractual restraints (Brickley, 1999), franchise compensation (Vázquez, 2005), power and control (Quinn & Doherty, 2000; Pizanti & Lerner, 2003; Dahlstrom et al., 2009), performance (Chaudey & Fadairo, 2008), multi-unit franchising strategies and internationalization (Sashi & Karuppur, 2002).

Agency theory portrays franchising as an organizational form that minimizes the organizational agency costs, especially the monitoring costs. This is because the manner in which earnings are shared between the franchisors and their franchisees

motivates the franchisees to be efficient. Franchisees are “owner-managers that typically bear the residual risks of a local operation because their wealth is largely determined by the difference between the stochastic revenue inflows to the local operation and promised payments to other factors of production” (Norton, 1988, p.201). Since the franchisee has a residual claim and ownership in the franchised unit, shirking is minimized.

Shane (1996b) proposes that franchising is a mechanism of minimizing agency problems of growth. He finds support for the hypotheses that (1) franchising provides faster growth, and (2) franchising increases a firm’s likelihood of survival. Because of the implied monitoring costs associated with overseeing company managers, the increase in potential income that may accrue with direct (or company) ownership of franchise outlets may be insufficient to offset the greater efficiency of the franchisee (Bergen, Dutta, & Walker, 1992).

Studies of domestic franchising empirically confirms the presence of agency costs and the importance of monitoring skills in the development of franchising. Norton (1988) hypothesizes that as monitoring costs increase, the incidence of franchising contracts increases as well. The two variables Norton (1988) uses as proxies for monitoring costs, population dispersion and labor intensity, are found to be positively associated with the percentage of establishments categorized as franchise holders. Norton (1988) finds support for the principal-agent explanation of franchise contracts. Brickley and Dark (1987) find support for the hypotheses that the proportion of franchising units increase with the employee monitoring costs and that industries characterized by non-repeat customers are less likely to franchise. The second

hypothesis reveals the downside of franchising -- the inefficient risk-bearing and free riding of some franchisees. Brickley, Dark, and Weisbach (1991) come up with similar results.

The conclusion of these studies on domestic franchising suggests that the focus of agency theory is to minimize agency costs. Based on these premises, Shane (1996a) developed a model to explain the internationalization of U.S. franchising systems as a function of bonding and learned monitoring capabilities. Shane (1996a) claims that franchisee opportunism can be reduced through ex-ante bonding mechanisms, or a pricing structure that requires high initial investment relative to royalties. He thus extends traditional agency explanations of franchising to the international environment and paves the way for the future development of international research on franchising. Extensions of Shane's model (1996a) have been developed by a number of scholars, including Alon (2006a), Castrogiovanni et al. (2006a), Garg and Rasheed (2003, 2006), and Welsh et al. (2006).

Given the focus of agency theory on agency costs and monitoring skills, a number of salient factors have emerged in the literature as potential explanatory variables for modeling international franchising. Our agency theoretic model of international franchising consists of a total of seven predictor variables: two variables associated with bonding and capital resources (FRratio and logAveTinv), two variables associated with franchising experience (Fexp and Franper), and three variables associated with geographical locations (logUscale, Disper, and Satur) which, in conjunction with the franchising experience variables, can be considered to be surrogates for the monitoring skills. We explain each of these below and propose

relevant hypotheses. Given the dynamic nature of a decision to go global, unlike previous studies this research estimates semi-parametric spline coefficients that allow for variation in the predictors.

## **Bonding and Capital Resources**

The franchising firm controls the ratio between the initial payment (fee) and the ongoing payments (royalties). In this fashion it controls the level of bonding. It has been hypothesized that the higher the level of bonding, the less the probability that a franchisee will act opportunistically (Shane, 1996a; Alon, 1999). This is because (1) the franchisee fee often accounts for more than one-half of the total investment of the franchisee, (2) the franchisee invests a major portion of his/her wealth in the business, (3) the standard franchising agreement allows franchisors to revoke the contract without returning the franchise fee if the franchisee does not strictly follow the operational guidelines of the franchise, and (4) as the cost of termination increases, the higher the initial fee is relative to the ongoing fees. “As the threat of opportunism is greater in international franchising than domestic franchising, one would expect to find higher franchise fees relative to royalty and advertising rates among companies that intend to expand overseas” (Shane, 1996a, p. 77). Shane measures the ex-ante bond as a ratio between the initial fee and the ongoing fees and finds support for the hypothesis that ex-ante bonding increases the likelihood of internationalization of the franchise system.

International franchising operations require that the franchisor manage the business in remote locations. Because remote locations have higher monitoring costs

(Combs & Castrogiovanni, 1994; Brickley & Dark, 1987; Norton, 1988), franchisors can price their business system such that the franchisee bears the greater risks. This is done by increasing the initial investment relative to the ongoing payments, or decreasing the royalties relative to the franchise fee. In this situation the franchisor is in the position to receive the franchise fee regardless of whether the franchisee business entity succeeds or fails. The advantage of using this price bonding variable is that the ratio is controlled by the franchisor.

Combs and Castrogiovanni (1994, p. 42) define royalties as the “proportion of the present value of intangible resources that cannot be incorporated into the up-front fee due to the unpredictability of unit sales.” Because international sales of U.S. franchising systems are likely to be more unpredictable overseas than domestically, international franchisors would prefer to receive more of the money up-front rather than over time in the form of royalties. A survey by Arthur Andersen (1996) shows that the initial franchise fees of international units tend to be the same or higher than those of domestic units, whereas the ongoing payments tend to be the same or lower. This finding is consistent with Shane’s finding (1996a) regarding the effect of price bonding.

Similarly, the total franchise investment needed by a franchisee to initiate a venture works as a bonding agent for the franchisor. In a sense, the total franchise investment is the “capital at risk” that the franchisee must put up. This franchise investment, which includes the start-up costs associated with getting the business up and running, is in jeopardy if the franchisee does not follow the rules of the franchisor, or fails to reach the performance criteria. Alon (1999) finds the start-up costs to be positively associated with the internationalization of professional business franchises.

Combs and Castrogiovanni (1994, p. 41) have noted that “high start-up costs suggest that the franchisee is the primary party risking loss of appropriable quasi-rents. These quasi-rents may actually provide an additional incentive for the franchisee to act in accordance with franchisor wishes in order to avoid quasi-rent appropriation.” Since start-up costs increase the effects of bonding between the franchisee and the franchisor, the more likely the franchisor is to internationalize, the higher the start-up costs. The significance of the start-up costs is consistent with Huszagh, Huszagh and McIntyre’s prediction (1992) that the equity capital requirements of the franchisor will emerge as a significant factor distinguishing between domestic and international franchisors.

The above explanation yields our first two hypotheses:

*H1: The higher the level of the franchise fee to the royalties bonding ratio, the more likely that the franchisor will seek international franchisees.*

*H2: The higher the level of franchise investment that is required, the more likely will that the franchisor will seek international franchisees.*

## **Franchise Experience**

Those franchisors that already have substantial franchising experience, either through direct operations of a large percentage of franchise outlets or through years of operations, are more likely to possess the type of monitoring skills that are needed for internationalization. Franchising operations require skills in monitoring remote locations that have different resource endowments and varying demands. As franchising

experience increases, firms are likely to develop organizational capabilities, managerial talent, local knowledge, long-distance management skills, cultural adaptability skills, and host country management skills (Combs & Castrogiovanni, 1994; Fladmoe-Lindquist, 1996; Norton, 1988; Oxenfeldt & Kelly, 1969). Huszagh, Huszagh and McIntyre (1992) propose that international franchisors have greater cumulative experience, scale economies, product differentiation, capital requirements, and headquarters benefits, thus allowing them to erect entry barriers against new firms and to compete successfully overseas as compared to domestic franchisors. As franchising firms gather more experience, they develop the routines and capabilities to monitor franchisees while reducing agency costs. Alon (1999) hypothesizes that the more franchised units that a firm has, the more efficient are its monitoring and performance-measuring capabilities. This is because the sheer volume of monitoring a large number of franchised units over time will generate organizational capabilities for more educated routines to identify shirking (Huszagh, Huszagh, & McIntyre, 1992). Enhanced monitoring capabilities reduce the incidence of opportunistic behavior by the franchisees, thereby allowing international expansion through franchising (Shane, 1996a; Fladmoe-Lindquist, 1996).

The more experienced franchisors are likely to have improved know-how about activities such as site selection, store layout, procurement, and operations that likely yield cost-reduction advantages relative to the less-experienced franchisors (Huszagh, Huszagh, & McIntyre, 1992). Such experience and know-how allow an older franchising firm to more successfully transfer its operating system to a foreign market than a young franchisor. Past research (Huszagh, Huszagh, & McIntyre, 1992; Alon, 1999, 2006a) support the premise that older franchisors are more inclined to have international

franchisees. When purely domestic franchisors were asked why their firms did not have franchises outside of the United States, the number one reason was that the company was too young (Arthur Andersen, 1996). Eroglu (1992) proposes that the older and more experienced a franchisor, the lower the amount of perceived risk associated with internationalization, and thus the more likely the franchisor will seek international franchisees. Huszagh, Huszagh, and McIntyre (1992) show that the age of the franchising system is positively related to its decision to internationalize. "These findings imply that experience is still a powerful tool for dealing with the physical and cultural distance inherent in franchising overseas. The inability of technology to substitute for experience appears to be borne out by these results" (Huszagh, Huszagh, & McIntyre, 1992, p.14). Based on this literature, our next two hypotheses are:

*H3: The greater the franchising experience of the franchisor, the more likely that the franchisor will seek international franchisees.*

*H4: The greater the percentage of franchised outlets in the company's system, the more likely that the franchisor will seek international franchisees.*

### **Geographical Locations**

At least three geographical considerations can be justified by agency theory and the previous literature on international franchising: (1) the scale of U.S. operations, (2) the extent of physical dispersion of the outlets, and (3) the saturation of the domestic market.

As firms grow in size by developing additional franchised outlets, they develop better skills and more experience in managing and monitoring franchisees, and in developing better routines to work with them. Economies of scale in purchasing, promotion, R&D, monitoring, and quality programs can result in cost reductions and can increase interdependencies between the franchisor and the franchisees. Experiences in sharing best practices among franchisees and managing across heterogeneous locations are likely to engender a desire on the part of growth-minded franchisors to venture abroad for new franchisees. The sheer volume of business experience in the larger systems has the potential of generating more educated routines to identify shirking (Huszagh, Huszagh, & McIntyre, 1992) and to develop more efficient systems to monitor effectively, thereby paving the way for growth through international expansion (Shane, 1996a; Fladmoe-Lindquist, 1996). Monitoring capabilities are likely to be especially critical to the success of an international franchisor (Fladmoe-Lindquist, 1996). Shane (1996a) finds support for the hypothesis that better monitoring skills increase the propensity of franchisors to internationalize.<sup>1</sup>

According to agency theory, franchisors with dispersed units require greater monitoring capabilities (Fladmoe-Lindquist, 1996). Franchisors with many franchisees in heterogeneous locations across the United States are better poised to take advantage of economies of scale for promotion and monitoring because such locations incorporate differing levels of return and risk (Huszagh, Huszagh, & McIntyre

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<sup>1</sup> Shane measures monitoring skills as a multiplicative composite index consisting of the number of franchised units, the percentage of franchised outlets, and the age of the franchise system. However, he does not propose any theoretical reasons for such a multiplicative measure. Further, since these variables are likely to be correlated, they potentially could obfuscate the regression coefficient results. For this reason, in this study we utilize the measure of geographical dispersion as a proxy for monitoring capabilities.

1992). Therefore, franchisors that are national in scope are more likely to internationalize because they have enhanced levels of monitoring capabilities in its domestic operations. For such systems, the foreign subsidiary becomes merely an extension to the domestic operations. This is especially true for franchisors that first seek international expansion in Canada or in other English-speaking countries. All things being equal, the more dispersed that the domestic franchising operations are, the greater the monitoring capabilities, and the more likely the franchisor will seek international franchisees.

There is also a greater probability that larger franchising firms have saturated the domestic market and are looking to grow through international expansion (Shane, 1996a). The more outlets the franchise system has in its domestic operations, the more likely it is to saturate the market and to look to expand overseas. Fast-food companies like McDonald's, Subway, or Burger King may have saturated much of their market in the United States. Early research also indicates that larger domestic franchisors have a higher preponderance of units outside the United States (Hackett 1976; Walker & Etzel, 1973). Aydin and Kacker (1990) show that smaller franchising systems are less likely than larger systems to seek international franchisees. Huszagh, Huszagh, and McIntyre (1992) also find a significant positive association between the number of units and the decision to internationalize. However, they expect that, in the future, technology, in particular telecommunications, will mitigate the influence of scale on the internationalization of franchising systems. A survey by Arthur Andersen (1996) reveals that franchisors with over 86 units are more likely to belong to the International Franchise Association and to have franchises operating outside the United States.

The above discussion yields our final three hypotheses associated with the geographical location of franchised units:

*H5: The greater the number of U.S. domestic outlets, the more likely the franchisor will seek international franchisees.*

*H6: The greater the dispersion of domestic outlets across the United States, the more likely the franchisor will seek international franchisees.*

*H7: The greater the level of saturation of the domestic market, the more likely that the franchisor will seek international franchisees.*

## **Methodology**

### **Data**

Data for the empirical analyses were obtained from the 2001-2008 successive annual editions of the *Bond's Franchise Guide*, a commonly used data source for franchising research (Dant, Kacker, Coughlan, & Emerson, 2007). The original dataset contained a total of 1,124 observations from 179 U.S.-based fast-food restaurant chains. However, not all of the chains responded to each of the eight years of the survey. To improve the quality of the analysis, we made a judgment call to retain only chains with at least 3 observations. Consequently, our analyses are based on 1,058 observations drawn from 158 chains.

The dependant variable “Y” is a dummy-coded (Yes/No) variable which asked the franchisor respondents whether or not they seek overseas expansion beyond North America. The predictor variables include two variables associated with bonding and capital resources (FRratio and logAveTinv), two variables associated with franchising experience (Fexp and Franper), and three variables associated with geographical location (logUscale, Disper, and Satur). The latter three, in conjunction with the franchising experience variables, can be considered to be surrogates for monitoring skills. Since there were huge variations among the franchisors in terms of the number of U.S. outlets and the average total investment, we log-transformed these measures (i.e., logUscale and logAveTinv) to alleviate any excessive influence of certain data points. Table 1 presents the full operational definitions of our measures. In addition to the seven predictors, we include three dummy variables (Area, Subf, and Addunit) associated with multi-unit franchising (i.e., the provision of area development agreements, sub-franchising, and adding new units) and age to capture the year in which the information was collected. Figure 1 shows the plots of the individual predictors against Y, with the lowess smoothing curves superimposed for visual enhancement.

*Insert Table 1 and Figure 1 about Here*

### **Statistical Technique**

In the international franchising literature where the response variable is frequently dichotomously measured, a logistic regression is the most commonly used analytic technique to assess the impact of its predictors (e.g., Shane, 1996a; Elango,

2007). The logistic model is a powerful tool in applied research with the basic model being  $\log[p/(1-p)] = \beta_0 + \sum_i \beta_i x_i$ , where  $p = \Pr(Y = 1)$  is the probability of seeking overseas expansion, and  $x_i$ 's are the predictor variables. The coefficients are usually estimated by maximizing the likelihood function and the goodness-of-the-fit is calculated by investigating the residuals (McCullagh & Nelder, 1989). A logistic model has been quite successful for many natural and social phenomena and is regarded as an excellent first-step approximation. However, it restricts the contribution of each factor to a linear term with a fixed coefficient. Consequently, most theoretical hypotheses tested are concerned with the significance of the coefficient (i.e., whether a particular factor is relevant), and/or the coefficient's sign (i.e., whether the factor under investigation increases or reduces the probability of the event of interest).

The actual dynamics of decision-making, however, can be much more complex. The contribution of some predictors may be nonlinear and thus the impact of these predictors will vary with their different values. Moreover, since the contribution may not be monotone, statements like “the larger the value of the predictor variable, the higher the probability the franchisor seeks overseas expansion” are misleading. Sometimes two or more predictor variables interact with one another to determine the response. The traditional approach to modeling such contingencies in parametric regression is the addition of two-way or higher-order product terms into the model. However, this strategy may still be too restrictive. To overcome the limitations of an ordinary logistic regression, we propose a semi-parametric model for the logistic regression:

$$\log[p/(1-p)] = \alpha_0 + \sum \alpha_i x_i + \sum f_j(x_j) + \sum f_{kl}(x_k, x_l), \quad (1)$$

where the contributions of certain  $x_i$ 's are linear, including those of the dummy variables, and those of the other  $x_j$ 's or pairs of  $(x_k, x_l)$ 's are continuous functions estimated by univariate or bivariate nonparametric smoothing. Essentially, we partition the predictor variables into a parametric group and a nonparametric group. Hence, the label "semi-parametric" is derived from the fact that a combination of both parametric and nonparametric components is used in the same model.

A natural approach to estimate these unknown  $f_j(\cdot)$ 's is to use basis functions like piecewise polynomials and splines (Wahba, 1990). For example, Bessaoud et al. (2005) incorporate B-splines into the logistic regression in medical studies. In this study, we propose using penalized spline smoothing. Here, each  $f_j(\cdot)$  is expressed as cubic thin plate splines

$$f_j(x) = \beta_{j0} + \beta_{j1}x + \sum_{k=1}^K \mu_{jk} |x - \kappa_{jk}|^3, \quad (2)$$

where,  $\kappa_{jk}$ 's are knots for  $x_j$  ((Ruppert, Wand, & Carroll, 2003, Ch. 3.10). The bivariate function  $f_{kl}(x_k, x_l)$  is estimated using a radial basis approximation (see Wand et al., 2005 for details). Cubic splines are claimed to be the lowest-order spline for which the knot-discontinuity is not visible to the human eye (Hastie et al., 2001). Usually there is no need to choose an order higher than cubic unless the derivatives are of interest.

Let  $\mu_j = (\mu_{j1}, \dots, \mu_{jK})^T$  and let  $K_j$  be the  $K \times K$  matrix with the  $kk'$ th element being  $|\kappa_{jk} - \kappa_{jk'}|^3$ . Subsequently, the model fitting is performed by maximizing the penalized log-likelihood

$$\sum [y_m \log(\hat{p}_m) + (1 - y_m) \log(1 - \hat{p}_m)] - \sum \lambda^3 \mu_j^T K_j \mu_j,$$

where the first term is the usual log-likelihood function for a logistic regression, the second term is the penalty for the coefficients of the radial functions as in (2). The smoothing parameter  $\lambda$  is chosen via a restricted maximum likelihood. Procedures for the selection of knots have been suggested in the literature (Ruppert, 2002; Miyata & Shen, 2003). There is no material difference between the results with varying knots in this study as long as the number of knots is reasonably large to capture the features of the data. Since the data are longitudinal, the ideal would be to fit a mixed effect model assigning a random effect to each fast-food chain. Unfortunately, numerical problems prevent us from doing this. Therefore, we adopt a cross-sectional approach. The data analyses are carried out using the default setting of R-package *SemiPar 1.0* (Wand et al., 2005).

## Results

Based on model (1), the additive impact of a predictor on the response can be quite different from the relationship between an individual predictor and the response, as shown in Figure 1, which often is one of the sources for the conflicting conclusions in the literature. For example, Figure 1 clearly shows that  $\log\text{AveTinv}$ ,  $\text{Satur}$ , and  $\log\text{Uscale}$  are positively related to the response variable. But if we run a simple logistic regression including all of the variables, their coefficients are negative, with p-values of 0.0016, 0.0132, and 0.1623 respectively. Nonetheless, a diagnostic like Figure 1 is often helpful to provide suggestions as to for which predictors we should use linear terms and for which predictors we should employ nonparametric smoothing.

Few studies are available to definitively guide us in terms of variable and model selection for the generalized additive model. In our study, the test for the parametric group can proceed with the usual Z-tests as in the traditional models. The test for the nonparametric group can be done by using a  $\chi^2$  test based on the difference of the deviance and the estimated degrees of freedom. Table 2 summarizes our final model, excluding Fexp and Addunit which are not significant at the 5% level. However, we emphasize that this exclusion does not mean that these two variables individually are not important. Rather, their additional contributions on top of those from the others already in the model are not significant.

For the lay reader and the practitioner, the most effective way to understand these results perhaps is to examine the contribution plot with a 95 percent pointwise confidence band as in Figure 2. Figure 2 shows the contributions of logAveTinv and logUscale respectively, whereas Figure 3 shows the joint contribution of Disper and Satur, which may help explain the unexpected trends observed in the literature.

*Insert Table 2, Figure 2, and Figure 3 about here*

## **Conclusions and Discussion**

It has been suggested that to mitigate opportunism, a franchisor may create stronger financial incentives by collecting higher-than-usual initial fees, thus creating a higher level of bonding between the franchisor and the franchisee. Opportunistic behavior by the franchisees can also be controlled through effective monitoring. Shane (1996a) finds support that monitoring, measured as a multiplicative composite index consisting of the number of franchised units, the percentage of franchised outlets, and

the age of the franchise system, is positively related to the internationalization of franchising. Elango (2007) captures the monitoring skills through the percentage of franchised units and the number of years of the franchise. In general, the greater the geographic dispersion of the franchised units in the system, the greater is the need to establish monitoring capabilities. Hence, franchisors with dispersed units are more likely to seek international franchisees since they are used to operating in distant locations and accustomed to taking advantage of economies of scale in promotion and monitoring (Huszagh, Huszagh, & McIntyre, 1992). Furthermore, domestic saturation provides another powerful incentive for seeking international expansion. Franchise systems with a large number of units in heterogeneous locations are likely to perceive saturation.

In this study, we employ the ratio of the average franchising fee over the average royalty rate as the empirical measurement of bonding together with the logarithm of the average total investment. As suggested by past research, we also use the franchising experience in years, the percentage of franchised outlets, the logarithm of the number of domestic outlets, and the number of states where the chain has outlets to model the propensity to internationalize. In addition, we believe that whether the system units are concentrated in a small number of states or are scattered across the country may be a relevant indicator of the chain's monitoring skills and the level of domestic saturation.

We propose the variable  $Satur=1-m/n$  to be a measurement of domestic saturation where  $m$  is the largest number of units in any single state and  $n$  is the number of domestic units. The expansion of franchisors into emerging and developing markets has increased the use of multi-unit franchising, which has been shown to be

positively related to system growth (Kaufmann & Dant, 1996). Several permutations of multi-unit franchising exist, i.e., (1) area development agreements that assign the franchisees a defined territory in which they are expected to develop additional units according to a predefined schedule, (2) sub-franchising contracts that allow the franchisee to be both the agent to the franchisor and the principal to the other sub-franchisees, and (3) basic multi-unit franchisee contracts, also called master franchisee contracts, that simply allow franchisees to establish additional units in a given territory. Three separate dummy variables were created to correspond to whether or not the franchisor allows a particular multi-unit permutation.

Data for all the variables were obtained from *Bond's Franchise Guide 2001-2008*. These data were collected using identical annual franchisor questionnaires in which participation was voluntary. The dependent variable was a dichotomous (yes/no) question which sought to ascertain whether or not the U.S.-based franchisor seeks overseas expansion. Logistic regression is the most commonly used methodology in studies with a dichotomous dependent response variable.

However, logistic regression restricts the contribution of each factor to a linear term with a fixed coefficient. Consequently, most theoretical hypotheses tested are concerned with either the significance of the coefficient and/or its sign. The true dynamics of decision-making can be much more complex. In this paper, we propose semi-parametric modeling for the logistic regression, where the contribution of a factor or a pair of factors can be any continuous function. Essentially, we partition the explanatory variables into the parametric group and the nonparametric group, where the contributions from the first group (including the dummy variables) are linear, and those

from the second group are estimated via penalized splines (Ruppert, Wand, & Carroll, 2003).

Based on our model, we find that bonding and the percentage of franchising units contribute positively to the propensity for international expansion. Both the contributions from the logarithms of the average total investment and the number of U.S. units manifest themselves in an interesting “U”-shape, which may indicate a threshold in terms of capital requirements and the franchisor’s monitoring capability. For example, the initial increase in the capital requirements may dampen the franchisor’s desire for international expansion since it will make it more difficult to attract new franchisees. But after passing the threshold, the large capital requirement may signal the franchisor’s strong position in the market and its concurrent desire to expand. The number of states in the United States with an operational presence and domestic saturation also contributed positively, as expected, to the propensity for international expansion, but in a nonlinear fashion. Consistent with past research, the permitting of area development agreements and sub-franchising agreements were also associated with a higher probability to seek international expansion.

In an attempt to explain this internationalization trend, academics have focused on two streams of research: one focusing on environmental determinants (country-specific factors) and the second focusing on organizational determinants (firm-level factors) that foster the internationalization process. The first stream of research focuses on either country studies (e.g., Alon & Welsh, 2001, 2002) or variables relating to the country’s environment which are conducive to internationalization (e.g., Alon, 2006b). Although these macro-oriented studies have been useful in explaining why some

countries receive more franchising investment, or why a franchisor will select a specific country of mode of entry, they are less useful in determining why specific firms within a given industry are more likely than others to internationalize.

The second stream of research, focusing on firm-level strategic variables, is helpful in distinguishing among franchising firms that internationalize versus those that remain focused domestically within a given industry. Using agency and resource-based theory, for example, Alon (1999) shows that the extent of internationalization of franchising firms can be largely explained by the size of the systems in a variety of industries (e.g., hotels, retailing, professional business services).

The conclusions in this article are twofold. First, by combining two theories of franchising, our total understanding of internationalization is improved. Second, many variables that explain international franchising are non-linear in their effects. Therefore, it is crucial that future researchers examine not only linear, unidirectional effects, but also non-linear impacts. In particular, our research shows that the effects of scale and investment are in fact curve-linear and concave, with higher and lower levels having a greater impact on the decision to internationalize.

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**Table 1**

**Operational Definitions of Variables**

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FRratio	the ratio of the franchising fee over the royalty rate (\$k/percentage).
logAveTinv	the logarithm of the average total investment (log(\$K)).
Fexp	the number of years the company has been franchising.
FranPer	the percentage of franchised units among the total number of units.
logUscale	the logarithm of the number of U.S. units.
Disper	the number of U.S. states where the company has a presence.
Satur	$1-m/n$ , where $m$ is the largest number of units in any single state and $n$ is the number of domestic units.
Area	indicator of whether area development agreements exist.
Subf	indicator of whether sub-franchising is allowed.
Addunit	indicator if additional outlets within the area can be added.
DEPENDENT "Y"	whether or not the franchisor seeks overseas expansion.

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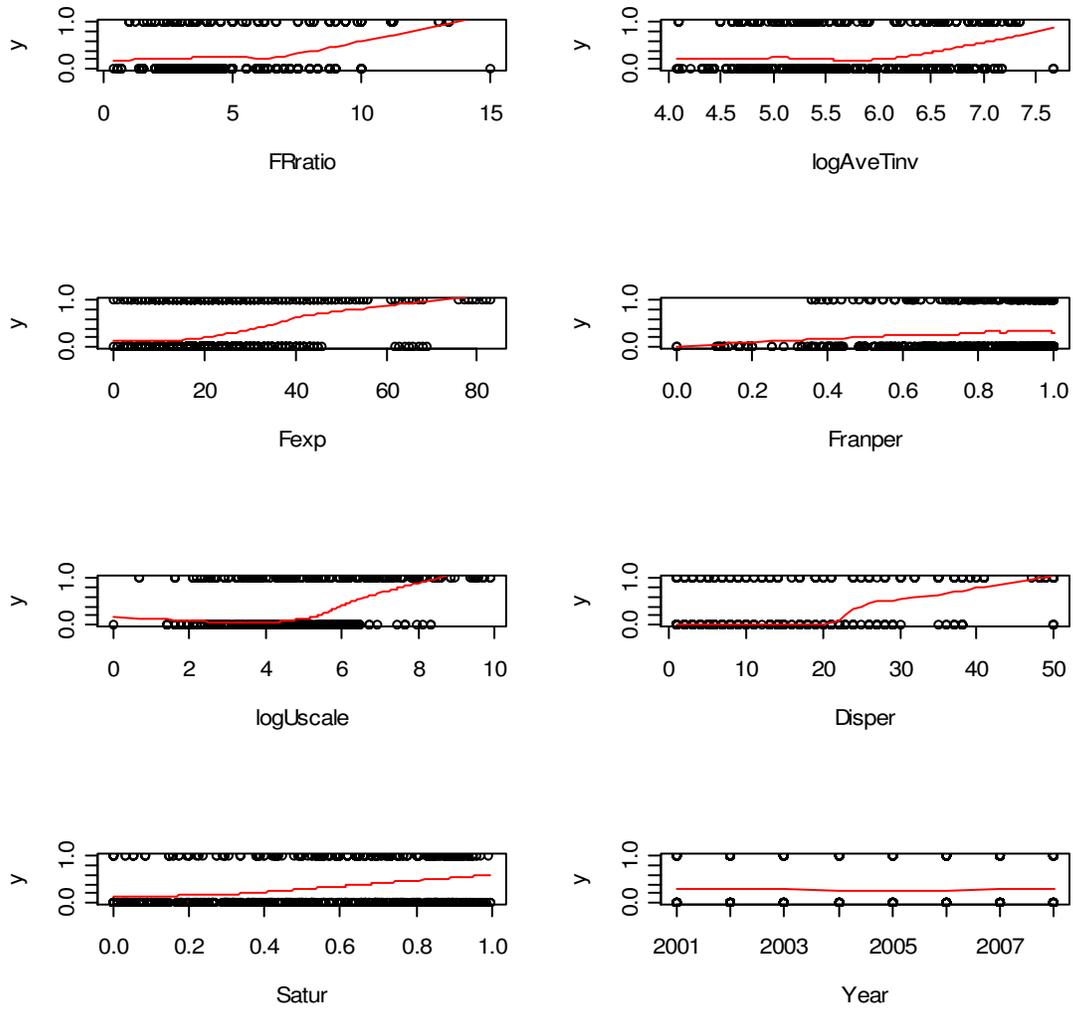
**Table 2**

**Summary of the Model Fit**

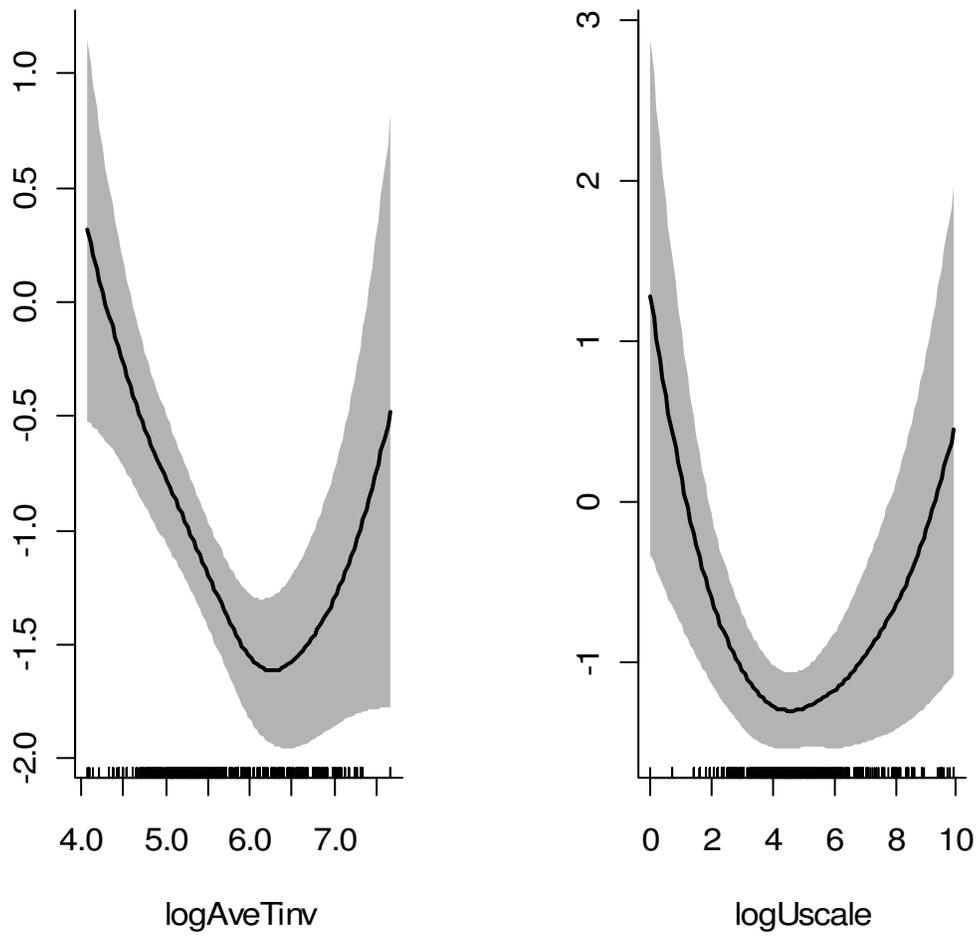
	Coeff.	St. dev.	Z-ratio	p-value
Intercept	-3.7440	1.2300	-3.044	0.0024
FRratio	0.2596	0.0495	5.246	0.0000
FranPer	1.4840	0.4703	3.157	0.0016
Area	0.6390	0.2585	2.471	0.0135
Subf	1.3450	0.1908	7.051	0.0000

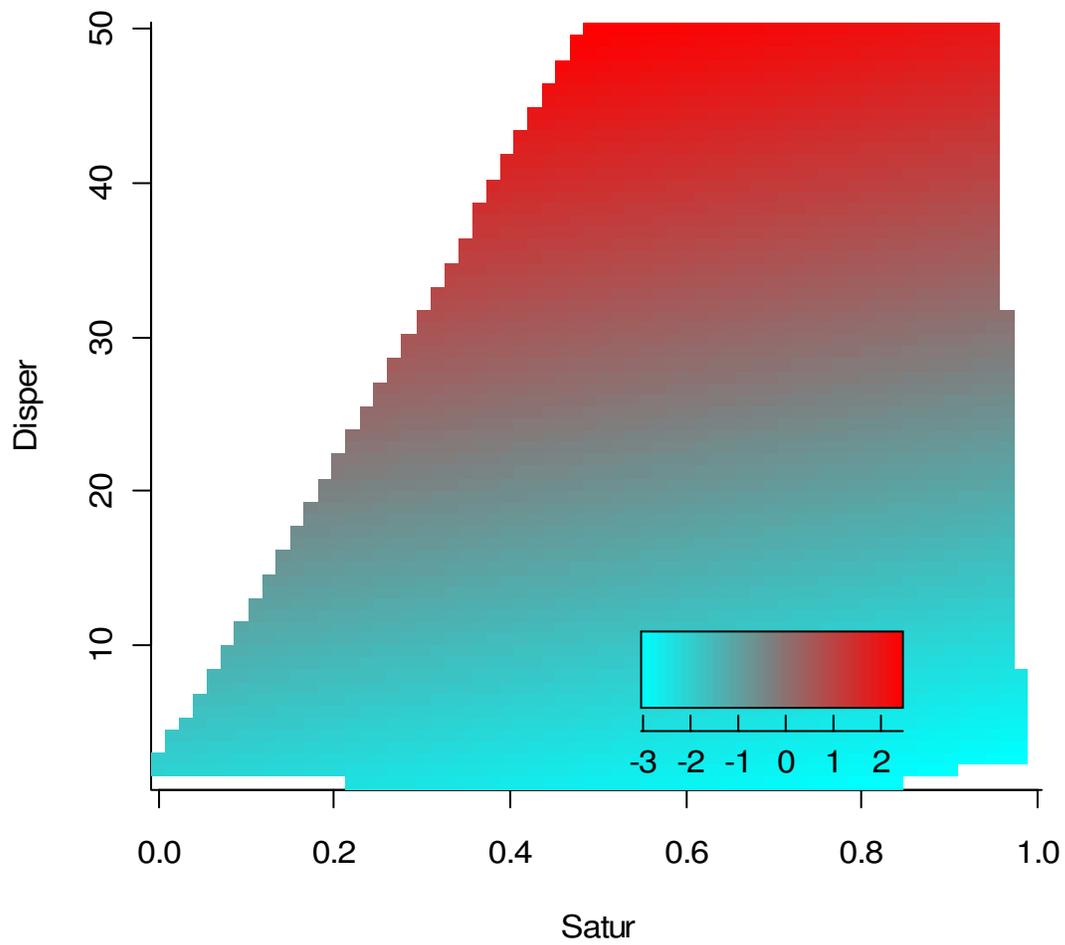
	df
logAveTinv	2.897
logUscale	2.450
Disper, Satur	2.000



**Figure 1. Individual predictors vs. the response**



**Figure 2. Estimated  $\hat{f}_j$  and its 95% confidence band**



**Figure 3. Estimated joint contribution of Disper and Satur**