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Master's Thesis

The Competition and Franchise Decision in Fast-Food Industry: Empirical Results in Taiwan

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Abstract

With shares over 30% in the restaurant market, the fast-food industry has recently become one of the most influential restaurant businesses of Taiwan. The literature has much discussed factors that affect the location strategies of fast-food companies such as the state of local competition conditions. In addition, some studies mentioned that a franchise system is the most common solution to the problem of asymmetric information between headquarters and restaurants for the fast-food industry. Although competition and franchising issues are significant in the Taiwanese fast-food industry, most empirical studies focus on cases in Europe and America. This study fills that gap by exploring empirically the unique features of this industry in Taiwan. The results show that more fast-food outlets are concentrated in more crowded districts or those where the population is averagely younger. The analyses also indicate that MOS Burger tends to move away from McDonald's when the market size is large or when proportion of children in the district is high. Finally, McDonald's in Taiwan tends to franchise the outlets in districts which are less populated, but have a low correlation with the auxiliary services provided by outlets.

Key Words: fast-food industry, location strategy, competition, franchising

摘要

近年來，速食業在台灣的營收約占餐飲業的三成以上，已成為台灣最具影響力的餐飲業之一。有許多文獻在探討有關影響速食店設點策略的因素，其中包括在地市場的情況以及與其他廠商之間的競爭條件。除此之外，多篇文獻亦指出，為解決總公司與分店之間的資訊不對稱問題，加盟系統是速食業者最常使用的解決方案。雖然競爭與加盟議題對於台灣速食業相當重要，但大多數的實證文獻都聚焦在歐美地區的案例。本研究藉由實證上探討台灣速食業的獨特性，以補足文獻上的缺漏。結果顯示，人口越密集和平均年齡越低的地區，存在越多的速食店。除此之外，本研究也發現摩斯漢堡在較大及有高比例兒童人口的市場，傾向遠離麥當勞以避免競爭。最後，實證結果亦指出，台灣麥當勞傾向加盟那些位於人口較少的地區，但是加盟與否和該分店提供的附加服務較無關。

關鍵詞：速食業，選址策略，競爭關係，加盟

Contents

I. Introduction

As a growing sector of the food industry in Taiwan, there are a number of pertinent issues that the fast-food industry is facing. Hu (2002) mentioned that compared to other restaurant industries, western fast-food firms can easily enter a market which is not limited by deeply ingrained local food culture. After the western fast-food industry came into the Taiwanese market in the mid-1980s, they significantly changed the traditional restaurant patterns of Taiwan, leading the industry into a new era. Marketing themselves as a symbol of youth and vitality, fast-food outlets sprang up all over Taiwan. As of today, there are thousands of outlets across every county.

As the domestic market gradually became saturated, fast-food firms started to switch from market expansion strategies to customer acquisition and retention strategies. As a restaurant business needs high visibility among consumers, the location of an outlet is one of the most important considerations for a fast-food firm. Moreover, since most of the desirable heavy-traffic areas are occupied by incumbent competitors, determining an outlet's final location is even more challenging. Therefore, it is an interesting and worthwhile research issue to understand the location strategies of fast-food firms.

How did these fast-food firms choose their outlet locations? Their strategies can be roughly divided into two different types. One strategy is based on considerations of local market situations such as demographic factors, consumer preferences, ease of transportation, etc, the other on that of competition with other fast-food firms. Distance to competitor's outlets is an important factor considered by many fast-food chains when deciding location since the similarity of different fast-food firms would influence a consumer's decision and affect revenues.

In addition, firms are not always able to locate their outlets at the most suitable districts.

The literature mentioned that, to solve the problem of asymmetric information caused by geographic isolation, franchising systems are most commonly used by western fast-food firms. Franchising systems are popular with restaurants and retail businesses in Taiwan, including bubble-tea stands and convenience stores. As an important solution to solve principle-agent problems, it might be another interesting sector related to location strategy of fast-food industry in Taiwan.

From the interesting phenomenon mentioned above, this paper tries to formulate three research problems. According to the two different types of location strategies, two models to examine empirical data are used. This paper tries to find the factors affecting the density of fast-food outlets, such as demographic factors and transportation convenience in the first model. In the second model, the distance to the nearest competitors' outlets is a proxy for competition. Finally, for the franchise problem, the third model tries to identify the factors affecting firm's franchise decision. Three models are introduced respectively in the following paragraphs.

The first part of this paper tries to find the factors affecting the location strategies of the fast-food industry in Taiwan. In addition to demographic factors, consumer's preferences, and ease of transportation mentioned above, Thomadsen (2007) mentioned that retail outlet locations in the fast-food industry depend on the market size. This part analyses domestic fast-food outlets data to examine the outlet density in individual markets under the effects of important demographic factors and outlet characteristics.

Competition with other fast-food firms is another important factor affecting a fast-food firm's location strategy mentioned above. In Taiwan, the first leader of fast-food industry is McDonald's, and the second firm is MOS Burger (MOS). To make the analyses easier, this model, as Thomadsen (2007) did considers McDonald's a stronger firm and MOS a weaker firm, . There is an interesting phenomenon in Taiwan: you could easily find a MOS outlet

beside a McDonald's most of the time. Since MOS entered the market later, most MOS outlets were set up after McDonald's did. Therefore, this phenomenon can be seen as a location strategy of MOS. The second part of this paper tries to identify the factors affecting the distance between McDonald's and MOS Burger. Thomadsen (2007) suggested that the stronger firm would prefer to be located beside the weaker firm in a small market area. However, if the market is large enough, the stronger firm will be located away from the weaker firm and each firm will be allowed to dominate in its own area. In contrast, the weaker firm's profits always increase with greater differentiation. It would be interesting if there exists location strategies different from past literature, or unique reasons that can explain the special phenomenon.

However, it is hard for every fast-food firm to locate their outlets at the most desirable districts. Sometimes firms face restrictions, and have no choice but to be located at a place lack of desirable advantages. To solve the problems caused by external restrictions, franchising systems are the most commonly used solution for restaurant businesses. As a new business form, franchising is not only one of the best solutions to principle-agent problems caused by asymmetric information, but also a popular organizational decision for retail firms. In recent years, franchised businesses have become one of the most popular business structures in the world, and Taiwan is no exception.

In fact, franchise systems developed very well in Taiwan, as applied in bubble-tea stands, convenience stores, and a number of other food industries. The influence of franchise systems on the food industry is an important issue. The final part of this study tries to identify the factors affecting the franchise decisions in the fast-food industry. Franchising makes franchisors develop rapidly and easily, efficiently building brand name capital (Hunt, 1973; Hunt & Nevin, 1974; Norton, 1995; Oxenfeldt & Thompson, 1968; Hsu, Jang & Canter 2010). As an industry requires high homogeneity in outlets, fast-food industry

benefits from franchising by quickly setting up a uniformed management system.

However, the fast-food industry in Taiwan seems to be different from that in western countries. In Taiwan, most of the famous fast-food firms are foreign companies, including McDonald's, Kentucky Fried Chicken (K.F.C.), MOS Burger (MOS), and Burger King. Among the brands mentioned above, only McDonald's is determined to have outlets franchised in Taiwan. Therefore, only McDonald's data is used in my analyses. Besides, much of the existing empirical analyses has been done by using North American data (Maruyana & Yamashita, 2010); this paper tries to use Taiwanese data to assess the robustness of the empirical results in different geographic areas.

Most of my data is secondary data, collected from official websites of McDonald's, K.F.C., MOS, Burger King, and Dan-Dan Burgers, including outlet's information, auxiliary services provided, and business hours, etc. Also, some demographic data is collected from government's databases of Ministry of the Interior (M.O.I.), Ministry of Finance (M.O.F.), and Ministry of Transportation and Communications (M.O.T.C.). In addition, this paper used ArcGIS to identify the distance of every McDonald's outlet to its nearest MOS outlet and the area of every administration district. Finally, since the franchise information of McDonald's is unavailable from the website, related data are collected by telephone surveys. Among the responses of the questionnaires, there are also lots of research sources about McDonald's franchisees that can be used for further work.

By using these data, my regression results show that demographic factors affect significantly both outlets density and the distance to the nearest competitors. In the first model, the higher the population density and the more convenient for transportation of an administration district, the more fast-food outlets are located at that district. On the contrary, the higher the average age of a district, the less fast-food outlets are located there. As for the second model considering competition relationships, the population of a district

has great positive influence on an outlet's distance to its nearest competitors. Besides, the results also show that if the district is large in area, MOS tends to move away from McDonald's more. Another interesting result is found in this regression result, which is scarcely mentioned in the literature. In this model, it is shown that in a district with higher proportion of children, the distance between MOS and McDonald's outlets become greater. The reason might be stronger distinctiveness of the two fast-food firms towards children.

Finally, my last part of regression results show that the lower the population level, the higher the likelihood of a McDonald's outlet being franchised. However, among four chosen auxiliary service, only the drive-through service has a positive impact on the decision that a McDonald's outlet be franchised, which is consistent with the literature.

The rest of this article proceeds as follows. In Section 2, I give a brief introduction to the fast-food industry and its history of development in Taiwan. In Section 3, relevant literature is introduced. Section 4 displays the data and descriptive statistics of the variables. Section 5 presents the three different models and the methodology. In Section 6, estimation results and analyses are reported. Finally, Section 7 concludes.

II. Fast-food Industry in Taiwan

Fast-food industry is a modern restaurant industry originated from western countries, and its definition differs from thesis to thesis. Robbins & Hass (1981) suggested that fast-food restaurants are defined as eating places that use standard food preparations, services, equipment, management systems, and labor savings technologies in providing a limited food menu. As for the case in Taiwan, Lin (1986) suggested that fast-food restaurants should feature convenience, simplicity, economy, and hygiene. Besides, the process of production, manufacture, and sale are almost simultaneously completed. Customer satisfaction is the most prominent in this industry. Outlets are usually clean and tidy, and friendly services are also required. Also, compared to other restaurants, fast-food

outlets tend to provide self-services rather than traditional table-services (Chen, 2011).

Different from the U.S.A. and most western countries, foreign fast-food industry had made a lot of change when they came into Taiwan. Most foreign firms adjusted their menu and meal size for the purpose of appealing to local consumers. For example, McDonald's once supplied rice burgers to fit Taiwanese eating habits. On the other hand, Americans usually eat much more than Asians, so western fast-food firms, such as McDonald's, K.F.C., and Burger King, reduced the size of meal to cut down the cost. Since the first western fast-food firm, McDonald's, entered the Taiwanese market in 1984; the Taiwanese fast-food industry has changed out of all recognition. In fact, western fast-food industry developed very well in Taiwan. According to Lu (2009), the annual revenue of foreign fast-food industries was 28.4 billion NTD in 2008, accounting for a large proportion, 32.16%, of the whole restaurant business. The history and development of fast-food industry in Taiwan will be briefly introduced in the following paragraphs.

In the early 1980s, there are only few local fast-food restaurants in Taiwan because of the protection policy. However, the government lifted the restriction under the political pressure of the U.S.A. It was not until January 1984 did a western fast-food firm, McDonald's, set up its first outlet in Taipei. In the same year, other American fast-food firms, such as K.F.C. and Wendy's, set up their outlets in succession. After that, western fast-food firms became more and more popular in Taiwan.

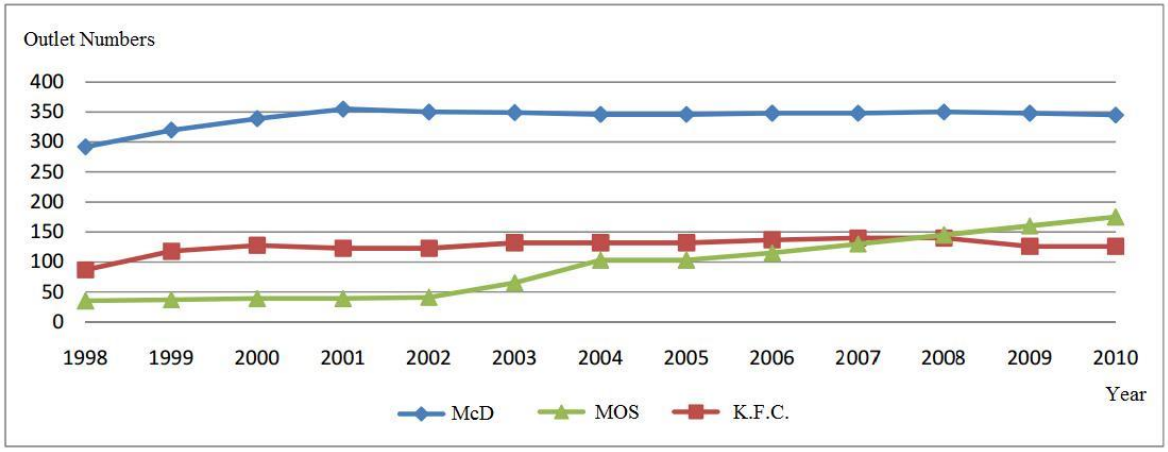
The second major entrance of western fast-food firms began in 1986. Hardee's, Church's, and Lotteria entered and made the market more competitive and diversified. In addition, another typical fast-food firm, pizza industry, entered in the late 1980s, including Pizza Hut and Dominos. Since then, western fast-food industry gradually matured with the rapid growth of the Taiwan local market.

In early 1990s, the first Japanese-style fast-food firm, MOS Burger, set up its first outlet

in Taipei, beginning to develop its business in Taiwan. Simultaneously, the world-famous fast-food brand, Burger King, also opened its first Taiwanese outlet in 1990. Facing the almost saturated domestic fast-food market, many firms tried to change their strategies so as to adapt themselves to the much competitive environment. Due to stronger competition and more difficult environment at that time, most firms tended to differentiate their products to attract specific groups of consumers. Besides, some firms even adjusted their operating pattern to improve their competitiveness. For example, McDonald's withdrew the concession of its joint company, Kuan-ta Food Cooperation in 1994, managing all of the original outlets by head office in the U.S.A. A few years later, McDonald's authorized the Taiwanese headquarter to franchise some of the outlets.

After 1994, some obsolete and traditional fast-food firms gradually exited the market, due to the competition from those strong international fast-food brands. McDonald's maintained the leading position and kept moderately developing. On the other hand, because of the successful differentiated strategies from McDonald's, MOS and K.F.C. defeated other competitors and claims the second and third highest market shares. Figure 1 illustrates the outlets variation of these leading firms from 1998 to 2010. It also shows that MOS performed relatively better than the other two firms in terms of an increase in the number of outlets. In 2008, MOS even defeated K.F.C. and became the second leader in Taiwan. In contrast, late entrants like MOS and Burger King did not do well and shut down its Taichung outlet in 2013, completely exiting the fast-food market southern Taiwan. A local fast-food firm called "Dan-Dan Burgers" dominated the southern Taiwanese market instead. Dan-Dan mixed western fast-food with Taiwan local-style food, such as a set with a burger and a bowl of oyster thin noodles. The localization strategy brought Dan-Dan great success in the southern Taiwanese fast-food market until now.

Figure 1 Outlets Variation from 1998 to 2010



Sources: Lu (2009), Effects of Country of Origin Image and Exotic Food Image on Purchase Intention.

Nowadays, the fast-food industry in Taiwan symbolizes fashion, trend, modernity, and youth. In the U.S.A., fast-food restaurants are usually considered lower-tier eating establishments. People in the U.S.A. often eat at fast-food outlets only when they are running out of time, or when they don't have enough money for high-class restaurants. According to different impressions from the U.S.A., this paper uses unique local data to examine whether empirical results are also different from those in the literature. Before showing empirical results using Taiwan data, some past literature will be introduced in the next part.

III. Literature Review

There is a number of literature concerning the competition and franchise decision in the fast-food industry. Among numerous issues mentioned above, this paper classifies them into three topics. The first topic is "demographic factors." Much literature found that there are demographic factors affecting the outlet density in a given market area. The second topic is "distance to nearest competitor," Under which some papers focus on relationships between location strategy and competition. The final topic is "franchising." This part introduces some papers discussing the use of franchise systems to solve principle-agent problems.

The literature of three different topics will be introduced in sequence below.

III.1 Demographic factors

According to Rydell, Harnack, Oakes, Story, Jeffery, & French (2008), there are lots of studies which have examined the demographic characteristics of those who eat at fast-food restaurants. People's preferences of fast-food have great effect on firms' decision of whether or not to set up an outlet in the specific area. This paper tries to use these demographic factors to explain the different outlet densities in each administration district.

Results from these studies indicate that those who are younger are more likely to consume fast-food. Paeratakul, Ferdinand, Champagne, Ryan, & Bray (2003) showed that fast-food consumption varied with demographic factors, which are higher among children, adolescents, and young adults. Blanck, Yaroch, Atienza, Yi, Zhang, & Masse (2009) indicated that younger adults relied more on fast-food places. Since younger people seem to consume fast-food much more, firms should prefer setting up outlets in a district the population of which has higher proportions of children and adolescents.

Besides, some studies have also shown that men are more likely to consume fast-food. Paeratakul, Ferdinand, Champagne, Ryan, & Bray (2003) mentioned that men reported more frequent consumption of fast food than women. Also, in a survey aiming towards students in Minnesota, United States, a greater proportion of females students (27%) than males (22.8%) reported never visiting a fast-food restaurant during the past week (French, Story, Neumark-Sztainer, Fulkerson & Hannan, 2001).

III.2 Distance to the nearest competitor

The theoretical literature mostly focuses on whether firms should minimally or maximally differentiate their products (Thomadsen, 2007). Distance to another outlet is one of the most important factors that can identify the difference of firms' products.

Empirically, Chan, Padmanabhan, & Seetharaman (2007) used a minimum distance method to estimate the location model with a primary data of the gasoline market in Singapore. In addition, there are lots of empirical papers discussing the distance of different outlets (Netz & Taylor, 2002; Smith, 2006; Eckert, 2013). Most of them use gasoline stations and supermarkets for empirical data sets, but there are few theses using fast-food outlets as examples.

D'Aspremont, Gabszewicz, & Thisse (1979) had shown that in order to soften price competition, identical firms tend to maximize their differentiation based on a Hotelling model. Seim (2006) indicated that there is a trade-off between getting close to large demand and differentiating from other competitors geographically.

However, some improved models performed different results about firms' geographic competition relationship. Anderson, Palma, & Thisse (1992) proposed an exception that firms will locate together at the center of Hotelling line if their consumers have heterogeneous preferences. Irmen and Thisse (1998) used Lancasterian models of product differentiation to show that standard results on prices and locations no longer hold when firms compete in a multi-characteristics space.

III.3 Franchising

The most common explanation for franchising is the agency theory (Brickley & Dark, 1987; Lafontaine, 1992). According to the agency theory, managers (the agents) paying a fixed salary tend to shirk and make the firm (the principal) incur monitoring costs to avoid the inefficiency of company-owned outlets. To solve the principal-agent problem, firms use franchise contracts to let franchisees share the profits and risks. Since the franchised outlets are compensated by residual claims from their outlets and put their own capital at risk, they are usually more motivated to run effective operations to maximize their profits (Shane, 1998).

Therefore, franchisors tend to franchise outlets with characteristics that increase the monitoring costs. One of the important characteristics is physical dispersion of operations. Norton (1988) suggested that franchising should be more common with physically dispersed operations, as in rural areas, since it costs more to monitor those outlets located far from the city. Accordingly, it is expected that the more physically dispersed an outlet is, the more likely it is to be franchised.

Another factor that may affect agency costs is franchisee's effort. Shepard (1993) mentioned that the agent's effort may not be subject to direct control because it is unobservable. If unobservable effort is important to a specific auxiliary service, managers of outlets providing these services have greater incentive to shirk. Therefore, it is assumed that the more specific auxiliary services (which need more unobservable effort) an outlet provides, the more likely it is to be franchised.

The literature mentioned above mostly used American data for their empirical results. One of the purposes of my paper is trying to use Taiwan fast-food industry data to test if the theory and results are robust domestically. In the next part, the data from fast-food industry and government statistical information in Taiwan are reported.

IV. Data and Variables

The data of every individual outlet are collected from the Taiwan official websites of McDonalds, MOS, K.F.C., and Burger King. Also, since all of the Burger King's outlets are located in northern Taiwan, this paper used another local fast-food brand located at southern Taiwan to balance the effect, which is called "Dan-Dan Burgers." Information on outlet locations, business hours, access to wireless internet, delivery, playground, and drive-through are reported for each single outlet. For McDonald's, the information of whether an outlet is franchised or company-owned is also reported. The outlets distribution (July, 2014) in Table 1 shows that, McDonald's is the leader of fast-food industry in

Taiwan with totally 405 outlets. MOS, a Japanese firm, keeps its step with McDonalds with 234 outlets. Surprisingly, the world-famous American fast-food brand, Burger King, only have 25 outlets in Taiwan, and most of them are located in Taipei. It is also an interesting issue to find the reason why an international fast-food dominator cannot develop successfully in Taiwan.

Table 1 Outlets Distribution in Taiwan (July 2014)

County	McD	MOS	KFC	BK	DD	Total
Taipei	77	95	20	18	0	211
Hsinpei	65	39	23	2	0	129
Keelung	4	1	2	1	0	8
Taoyuan	39	15	15	3	0	72
Hsinchu County	5	4	2	0	0	11
Hsinchu City	13	7	4	1	0	25
Miaoli	8	1	2	0	0	11
Taichung	57	27	17	0	0	101
Changhua	15	3	5	0	0	23
Yunlin	5	3	2	0	0	10
Nantou	5	2	2	0	0	9
Chiayi County	3	1	0	0	0	4
Chiayi City	7	3	3	0	0	13
Tainan	29	9	8	0	14	60
Kaohsiung	50	16	15	0	27	108
Pingtung	11	2	2	0	3	18
Yilan	5	3	3	0	0	11
Hualien	4	1	1	0	0	6
Taitung	2	0	1	0	0	3
Penghu	1	1	0	0	0	2
Kinmen	0	1	0	0	0	1
Total	405	234	127	25	44	836

Sources: Official websites of each fast-food company.

As for controlling the physically dispersed operation related factors, this paper uses demographic data to identify rural and urban areas in Taiwan. The total population and the percentage of men of every district are collected from the Department of Household Registration, M.O.I. Also, this paper uses the average age and the percentage of child, adult, and elderly in order to control the effects of age distribution.

Besides, this paper uses the average annual total net income of every administration district to represent the income. The data is collected from the Taxation Administration, M.O.F.

In addition, since not only local residents have great impacts on the firm's organizational decision, but also tourists are an important factor. Therefore, the attractions dummy is added into my data in order to control impact by tourists. The data are collected from the Tourism Bureau, M.O.T.C.

In order to measure the geographic differentiation between McDonald's and MOS Burger, this paper uses ArcGIS to identify the distance of every McDonald's outlet to its nearest MOS outlet. Also, the area of every administration district is reported by ArcGIS.

The data of these demographic factors are reported in December, 2013.

Apart from the data available from the Internet, this paper also uses the method of telephone survey to acquire specific information about McDonald's outlets. (See Questionnaire 1 in the Appendix.) According to the questionnaire results, it is possible to distinguish between franchised outlets and company-owned outlets. Also, the results show that most outlets owned by the same franchisee are close to each other geographically. Besides, most franchisees were engaged in finance, electronics, and information industries before they joined McDonald's franchising system. There are many reasons why they decided to become McDonald's franchisees. Most common reasons mentioned by franchisees are good corporate image, matured and sound franchising system, and

powerful support from the headquarters. As for the location of outlets, some franchisees said that their outlets originally had been company-owned. Most of the information will not be used in my regression analyses, but it is still an important material for topics about franchisees' tendency of being involved in franchising.

In the next part, the dependent variables in three different models along with some specific independent variables and control variables are presented.

IV.1 Demographic factors

In order to identify factors affecting the decision of set-ups of fast-food outlets', this paper classifies different markets by administration districts. The dependent variable is the number of outlets in every district. Table 2 shows the descriptive statistics of all 367 administration districts in Taiwan. ***Total*** is used as the dependent variable, which is the number of total fast-food outlets in each different district.

Table 2 Demographic Variable Definitions and Descriptive Statistics

Variable	Definition	Mean	Standard Deviation	Maximum
Total	Outlets numbers of each administration district.	2.27248	4.82218	31
Population	Total population of each administration district (thousands people)	63.67569	81.5345	556.92
Density	Population density (population divided by area) of each administration district	.2687849	.5532762	3.715546
Pct_Men	Men Percentage of the total population	51.61038	1.97269	58.924
Avg_Age	Average age of each administration district	40.62047	2.839645	47.92621
Pct_Child	Children Percentage of the total population	13.72404	3.157061	31.59749
Pct_Elder	Elderly Percentage of the total population	13.47191	4.63419	30.63203
Edu_Year[1]	Average completed years of schooling of the people of each administration district	10.78525	1.301783	13.61474
Income	Annual total net consolidated income of each administration district (thousands NTD)	13558.12	23925.24	189758.3
Avg_Income	Income divided by total population (NTD/person)	722.1853	170.7973	1775
Attractions	Tour attractions at each administration district	3.918256	6.325322	73
TRA_rank[2]	Taiwan railway stations at each administration district, ranked by six level	1.656676	2.836502	16
HRS_rank[3]	Taiwan high speed rail stations at each administration district, ranked by six level	.119891	.8076222	6
Airport_rank[4]	Airport at each district, ranked by six level	1498638	.7731094	6

Sources: Department of Household Registration, M.O.I., Taxation Administration, M.O.F., Tourism Bureau, M.O.T.C., Taiwan Railways Administration, Taiwan High Speed Rail, Civil Aeronautics Administration, M.O.T.C.

[1] Education year counting: Uneducated and self-study people are 0 year; elementary school graduated people are 6 years; junior high school graduated people are 9 year; junior vocational school graduated people are 11 years; high school or high vocational school graduated people are 12 years; junior college (five/two-year program) graduated people are 14 years; three-year program graduated people are 15 years; technology institute, college, independent college graduated people are 16 years; M.A. graduated people are 18 years; Ph.D. graduated people are 22 years.

[2] Taiwan Railway station are ranked by 6 class: the special class stations are weighted by 6; the first class stations are weighted by 5; the second class stations are weighted by 4; the third class stations are weighted by 3; the simple stations are weighted by 2; and the staffless stations are weighted by 1.

[3] Taiwan High Speed Rail stations are ranked by 2 class: Taipei, Banqiao, Taichung, Zuoying are ranked as the special class stations of TRA, and weighted by 6; Taoyuan, Hsinchu, Chiayi, Tainan are ranked as the first class stations are weighted of TRA, and weighted by 5.

[4] Airport are ranked by 5 class: the special class airport, Taoyuan International Airport, is weighted by 6; the first class airports, Taipei and Kaohsiung International airports, are weighted by 5; the second class airports are weighted by 4; the third class airports are weighted by 3; the fourth class airports are weighted by 2.

IV.2 Distance to the nearest competitor

This model uses ***MOS_Dist*** as the dependent variable, which is the distance to the nearest MOS outlet from a McDonald's outlet. There are two reasons that the distance to nearest McDonald's outlet from a MOS outlet is not used as my dependent variable. First, McDonald's is an incumbent firm, while MOS entered Taiwan about 15 years later. Observing McDonald's outlets rather than MOS better explains the entry strategy of MOS. Second, since the count of McDonald's outlets are greater than MOS outlets, the set of distances from MOS to the nearest McDonald's is a subset of the set of distances from McDonald's to nearest MOS. Observing MOS outlets would lead to omission of some McDonald's outlets, which would underestimate the competitive strength.

To identify the market size, this model uses ***Area_km2*** as an independent variable, which is area of the administration districts in which the McDonald's outlets are, measured by ArcGIS. Some McDonald's outlets and their nearest MOS outlets might be located at different districts. To control this effect, the ***Diff_Dis*** dummy is added in, which is equal to 1 if the McDonald's outlet and its nearest MOS outlet are located in different districts. However, there may be two situations: one is that the two outlets are located at the border of districts, which means that although the two outlets are located in different district, they are actually close to each other geographically. In this situation, the ***Area_km2*** dummy can still explain the local market size well. The other situation is that the distance between the two outlets located in different districts is large. In this situation, the McDonald's outlet is a local monopolist at least in this market. The influence power of MOS to this McDonald's outlet is relatively low. Therefore, to identify the influence of different degrees of distance, the ***Dis_k*n** dummies are also added, where **n** is between 2 to 5.

Table 3 shows the descriptive statistics of all 405 McDonald's outlets' distance-related variables used in the second model.

Table 3 Distance-related Variable Definitions and Descriptive Statistics

	Variable Definition	Mean	Standard Deviation	Maximum
MOS_Dist	The distance to the nearest MOS outlet from a McDonald's outlet (kilometers).	2.559227	7.668527	82.07724
Area_km2	The area of each administration district (km^2)	39.55716	32.83766	258.6556
HHI[5]	Herfindahl-Hirschman Index of each district	.4747382	.2030043	1.0000
Diff_Dis	A dummy variable which equals to 1 if the McDonald's outlet and its nearest MOS outlet are located at different administration district.	.291358	.4549501	1
Dist_k5	A dummy variable which equals to 1 if the distance to nearest MOS outlet from a McDonald's outlet is greater than 5,000 meters.	.1135802	.3176932	1
Dist_k4	The same as above, while distance is greater than 4,000	.1407407	.348184	1
Dist_k3	The same as above, while distance is greater than 3,000	.1802469	.3848684	1
Dist_k2	The same as above, while distance is greater than 2,000	.2419753	.4288091	1

Sources: MOS_Dist, Area_km2, and Dist_kn variables are measured by ArcGIS.

IV.3 Franchising

In this part, the primary objective is to identify what factors affect the firm's franchise decision. Thus, this paper classifies McDonald's outlets into two categories: franchised outlets and company-owned outlets. The dependent variable is a dummy, which equals to 1 if the outlet is franchised, and equals to 0 if it is owned by McDonald's.

Some demographic variables are considered a proxy for physical dispersion. ***Population*** can be used to define urban areas and rural areas in Taiwan. The descriptive statistics of demographic factors are reported in Table 2.

To classify auxiliary services means that this paper tries to define what services need more unobservable efforts. An outlet providing greater variety of services is more likely to be franchised. This paper classifies ***24HRs*** and ***WIFI*** into observable services, and

[5] The HHI is measured by: $\sum(\frac{SubOutlet_i}{SubTotal})^2$, while $SubOutlet_i$ is outlets number of firm i in each administration district, and $SubTotal$ is the total outlets number in each administration district.

Drivethru and ***Playground*** into unobservable services. It is easy for McDonald's headquarter to examine whether an outlet is running for 24 hours, or provides wireless internet service. However, such services provided by staffs like drive-through and playground management are hard to supervise, making them unobservable services. Table 4 shows the descriptive statistics of all 405 McDonald's outlets' franchising variables used in my second model.

After describing the variables, the empirical models are presented in the next part.

Table 4 Franchising Variable Definitions and Descriptive Statistics

	Variable Definition	Mean	Standard Deviation	Maximum
Ownership	A dummy variable which equals to 1 if the outlet is franchised, and equals to 0 if company-owned.	.1333333	.3403551	1
24Hrs	A dummy variable which equals to 1 if the outlet provides 24-hours service.	.5901235	.492419	1
WIFI	A dummy variable which equals to 1 if the outlet provides wireless internet service.	.9037037	.295362	1
Drivethru	A dummy variable which equals to 1 if the outlet provides drive-through service.	.3432099	.4753681	1
Playground	A dummy variable which equals to 1 if the outlet provides a children playground.	.6444444	.4792734	1

Sources: Ownership variable are collected from questionnaire of telephone survey. Auxiliary services variables are collected from official websites of each fast-food company.

V. Model

In order to estimate the three different dependent variables, ***Total***, ***MOS_Dist***, ***Ownership***, three different models are used to estimate them respectively. For the "demographic factors" model, *zero-inflated Poisson* regression is used to estimate the total amount of outlets in a specific district. For the "distance to nearest competitor" model, the *robust OLS* model is used to estimate the distance from a McDonald's outlet to its nearest MOS outlet. Finally, for the "franchising" model, *probit* model is used to estimate the ownership of a McDonald's outlet, since the dependent variable is a dummy of 1 and 0.

V.1 Demographic factors

The dependent variable of the first part in this paper is the number of outlets in each administration district. However, since the count data of outlets in each district includes excess zeros, *zero-inflated Poisson* (ZIP) regression is used, for handling zero-inflated count data (Lambert, 1992). Table 5 shows the distribution of fast-food outlets numbers.

Table 5 Total outlets of each administration district frequency

Total	Count	Percentage
0	213	58.04%
1	46	12.53%
2	23	6.27%
3	14	3.81%
4	18	4.90%
5	10	2.72%
6	3	0.82%
7	5	1.36%
8	4	1.09%
9	4	1.09%
10	4	1.09%
11	3	0.82%
12	2	0.54%
13	2	0.54%
14	1	0.27%
15	1	0.27%
17	1	0.27%
19	4	1.09%
20up	9	2.45%
Total	367	100.00%

The zero-inflated Poisson (ZIP) assumes that the events,

$Y = (Y_1, Y_2, \dots, Y_n)$ are independent and

$Y_i = 0$ with probability $p_i + (1 - p_i)\exp(-\lambda_i)$,

$Y_i = y$ with probability $\frac{(1-p_i)\exp(-\lambda_i)\lambda_i^y}{y!}, y = 1,2, \dots,$

where y is the natural number of fast-food outlets in every administration district. Maximum likelihood estimation (MLE) is used to estimate the coefficients of zero-inflated Poisson (ZIP) regression model.

To test the fitness of using the zero-inflated Poisson model rather than the basic Poisson model, this paper uses Vuong's statistic for the model (Vuong, 1989). Vuong's statistic is determined by computing,

$m_i = \ln(\frac{f_1(y_i|X_i)}{f_2(y_i|X_i)})$,

where $f_1(y_i|X_i)$ is the probability density function of the zero-inflated model and $f_2(y_i|X_i)$ is the probability density function of the Poisson distribution. Vunog's statistics for testing the zero-inflated model versus traditional model is (Lee & Mannering, 2002),

$$V = \frac{\sqrt{n}\left[\frac{1}{n}\sum_{i=1}^{n} m_i\right]}{\sqrt{\frac{1}{n}\sum_{i=1}^{n}(m_i - \bar{m})^2}} = \frac{\sqrt{n}\bar{m}}{S_m},$$

where $\bar{m}$ is the mean, S_m is the standard deviation, and n is a sample size. Vuong's value is asymptotically standard normally distributed. The zero-inflated model is favored if the V value is greater than 1.96 (the 95% confidence level for t-test) (Greene, 2003).

In this model, ***Population*** is the independent variable to explain the inflated-zero count data, since most of districts without fast-food outlets are rural or remote areas.

Therefore, rewriting the estimated model as below:

$Total = (Total_1, Total_2, \ldots, Total_{367})$ are independent and

$Total_i = 0$ with probability $p_i + (1 - p_i)\exp(-\lambda_i)$,

$Total_i = y$ with probability $\frac{(1-p_i)\exp(-\lambda_i)\lambda_i^y}{y!}, y = 1,2, \ldots,$

The parameters λ and p satisfy

$$\log(\lambda) = \alpha_1 + \beta_i X_i + \varepsilon_1$$

$$\text{logit}(p) = \log\left(\frac{p}{1-p}\right) = \alpha_2 + \gamma_i Population_i + \varepsilon_2 \quad \ldots(1)$$

V.2 Distance to the nearest competitor

The dependent variable of this model is ***MOS_Dist***, which is the distance to the nearest MOS outlet from a McDonald's outlet. This paper uses a simple reduced form robust OLS regression to estimate:

$$MOS\_Dist_i = \alpha + \beta_j X_j + \gamma_i Diff\_Dis_i + \delta_i Dis\_kn_i + \varepsilon_i \quad \ldots(2)$$

Where α is an intercept, X_j is the vector of j^{th} district's demographic variable. $Diff\_Dis_i$ is the dummy of whether the i^{th} outlet is located at the different district with its nearest MOS outlet. Dis_kn_i is the dummy whether the distance of the i^{th} outlet between its nearest MOS outlet is greater than n kilometers, where $n = 2,3,4,5$.

V.3 Franchising

As in Lafontaine (1992) and Maruyana & Yamashita (2010), this paper uses a Probit estimator in the regression since there is only one firm to be researched, and the dependent variable is a dummy which equals to 1 or 0. This paper tries to make a similar empirical analyses with Lafontaine (1992), using Taiwanese data. The estimated model is:

$$Ownership_i = \alpha + \beta_j X_j + \gamma_{ki} Z_{ki} + \varepsilon_i \quad \ldots(3)$$

Where $Ownership_i$ is the ownership structure of outlet i, α is an intercept, X_j is the vector of the j^{th} district's demographic variable. Z_{ki} is the vector of the k^{th} auxiliary service dummy variable which is provided by outlet i. β_j and γ_{ki} are the vectors of parameters of corresponding independent variables.

The results of all the models mentioned above are reported in the next part, while some of them might not be consistent with the literature. This paper will also briefly analyze the results and conclude in the final part.

VI. Results

Briefly speaking, the "demographic factors" model is almost consistent with the past thesis. Only ***Pct_Men*** shows a different sign compared to the literature. As for the "distance to the nearest competitor" model, this paper finds an interesting result about the percentage of children, which is less mentioned by past literature. Finally, in the "franchising" model, service variables are not significant enough to explain the ownership of outlets.

VI.1 Demographic factors

Results obtained under zero-inflated Poisson regression are given in Table 6. The Vuong statistic (4.57) indicates that zero-inflated model is quite suited. The significantly positive coefficient of ***Density*** variable indicates that fast-food outlets tend to be set up in densely populated areas. Also, the signs of the coefficient of ***TRA_rank*** and ***HRS_rank*** are positive and significant, which shows that transportation hubs have great effects on the entry decision of fast-food firms. The ***Pct_Men*** variable is significantly negative, which means an area with higher male population has relatively less fast-food outlets. This result is quite different from that of the literature. It might because of different preferences of people in Taiwan and the US. The ***Avg_Age*** variable is significant, showing a negative sign. It indicates that if the area is averagely younger, there would be more fast-food outlets. The result is consistent with the literature, showing that fast-food is more popular with children and youths.

In addition, the ***Edu_year*** variable is significantly negative. Since the model has controlled the age and income factor, this variable can be considered the independent effect of educational level. The negative sign means that if people of specific district have had little schooling, there are more fast-food outlets in that district. ***Avg_Income*** and

Attractions are control variables, making other independent variables explained better.

The ***Population*** in the inflation logit model is significantly negative, meaning that the population can explain the inflated zero observations well. In addition, the negative sign means that in those sparsely populated district, there are more likely no fast-food outlets.

Table 6 Zero-Inflated Poisson Estimation Results of Demographic Factors

	Dependent Variable	
Variable	**Total**	**Inflate**
Density	0.2223***	
	(0.0521)	
Pct_Men	−0.5987***	
	(0.0503)	
Avg_Age	−0.1577***	
	(0.0229)	
Edu_year	−0.2449***	
	(0.0604)	
Avg_Income	0.8215***	
	(0.2028)	
Attractions	−0.0034***	
	(0.0036)	
TRA_rank	0.0578***	
	(0.0126)	
HRS_rank	0.0369**	
	(0.0255)	
Airport_rank	−0.0262	
	(0.0371)	
Population		−0.1258***
		(0.0262)
Constant	39.2054***	4.0873***
	(3.1623)	(0.7986)
Log-likelihood at convergence	−412.7992	
Number of observations	367	
Vuong statistic	4.75	

Significance levels: ***=0.01, **=0.05, *=0.1

VI.2 Distance to nearest competitors

The Results of the robust OLS estimation are shown in Table 7. By using ***Diff_Dis*** and ***Dis_k*n** dummies to control the effect of those outlets far from their competitors, the coefficient of the market size variable ***Area_km2*** is significantly positive. The result is consistent with the theory, proving that if the market is geographically large enough, MOS would prefer to keep away from McDonald's to avoid competition. Also, locating at two opposite sides would create an environment similar to local monopoly, allowing both firms to gain higher profits.

The ***Dis_k*n** variable is used to control the fixed effects of competitors which are far from McDonald's outlets. As the controlled distance becomes greater, the coefficient becomes greater. This means that when higher distance is controlled, the explanatory power of the ***Dis_k*n** variable becomes greater.

The ***HHI*** variable shows a positive sign but is less significant if the controlled distance is too long. HHI is considered an index measuring the degree of market concentration and competition. As a weaker firm, MOS tends to move further away from McDonald's in the district with high HHI.

Finally, by controlling the educational variable, the ***Pct_Child*** and ***Pct_Elder*** variable can better explain the effect of age factor. The ***Pct_Child*** variable shows a significantly positive sign regardless of the controlled distance, meaning that in those districts with more children, MOS tend to keep away from McDonald's.

Table 7 Robust OLS Estimation Results of Distance to Nearest Competitor

	MOS_Dist				
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Area_km2	0.0696***	0.0631***	0.0620***	0.0590**	0.0511**
	(0.0257)	(0.0252)	(0.0246)	(0.0235)	(0.0222)
Diff_Dis	2.9067***	1.7509***	1.3364**	0.9518*	0.9781*
	(0.6921)	(0.6473)	(0.5866)	(0.5185)	(0.5199)
Dist_k2		3.8715***			
		(0.5012)			
Dist_k3			5.9749***		
			(0.8827)		
Dist_k4				8.7361***	
				(1.3933)	
Dist_k5					10.1846***
					(1.7247)
HHI	7.2807**	6.2535**	5.5843*	5.3436*	4.2212
	(3.490)	(3.4311)	(3.3731)	(3.2094)	(3.1518)
Pct_Men	-1.5167***	-1.6896***	-1.9982**	-2.1951**	-1.8097**
	(0.9438)	(0.9406)	(0.9598)	(0.9633)	(0.9094)
Pct_Child	0.4631***	0.4261***	0.3844***	0.3134**	0.2426**
	(0.1506)	(0.1494)	(0.1423)	(0.1245)	(0.1104)
Pct_Elder	0.3899***	0.3924***	0.2922**	0.1315	-0.0092
	(0.1348)	(0.1304)	(0.1296)	(0.1258)	(0.1278)
Edu_Year	-2.9457**	-2.7064*	-2.6026*	-2.6639*	-2.5064*
	(1.6218)	(1.6098)	(1.5681)	(1.4944)	(1.4667)
Income	-0.00004**	-0.00004**	-0.00005***	-0.00005***	-0.00004**
	(0.00002)	(0.00002)	(0.00001)	(0.00001)	(0.00002)
Population	0.0084**	0.00975**	0.0115***	0.0108***	0.0065*
	(0.00403)	(0.0039)	(0.0041)	(0.0040)	(0.0035)
Attractions	-0.0312*	-0.0231	-0.0134	-0.0031	0.0009
	(0.0178)	(0.0171)	(0.0171)	(0.0172)	(0.0172)
Constant	94.9112	100.9050	116.8463*	130.2110**	113.0011*
	(62.6765)	(62.4531)	(62.9633)	(62.5741)	(60.0435)
Observation	405	405	405	405	405
R-square	0.3508	0.3765	0.3891	0.4236	0.4334

Significance levels: ***=0.01, **=0.05, *=0.1

VI.3 Franchising

Table 8 shows the results of the probit estimation of the franchising model. The coefficient of the demographic variable, such as ***Population***, is significantly negative, which means that if the location of an outlet is sparsely populated, it costs much more for firms to monitor the agents, making the outlet more likely to be franchised.

As for the service dummies, the coefficients on the auxiliary service variables needs more unobservable effort to be significantly positive, which means that the more auxiliary services an outlet provides, the more likely it is to be franchised. On the other hand, those coefficients on other services that need more observable efforts should be negative.

However, according to my results, both variables are not significant. In fact, since over 90 percent (90.37%) of McDonald's outlets provide wireless internet services, it may be the reason that the ***WIFI*** variable cannot be a good proxy for observable service.

The ***Drivethru*** variable is significantly positive, which is consistent with the past literature. The positive sign means that if an outlet provides drive-through service, it is likely that it would be franchised. Moreover, the marginal effect shows that if an outlet provides drive-through service, the possibility of this outlet to be franchised increases about 6 percent.

Table 8 Probit Estimation Results of Franchising

	Ownership	
Variable	**Coefficients**	**Marginal Effects**
Population	−0.0025***	−0.0004***
	(0.001)	(0.0001)
24Hrs	−0.2616	−0.0412
	(0.1993)	(0.0331)
WIFI	−0.1066	−0.0172
	(0.3253)	(0.0556)
Drivethru	0.4109***	0.0687***
	(0.2070)	(0.0379)
Playground	−0.3748**	−0.0617**
	(0.2191)	(0.0384)
Pct_Men	0.3088***	0.0471***
	(0.1055)	(0.0166)
Attractions	−0.0141	−0.0021
	(0.0131)	(0.0019)
Log-likelihood at convergence	−124.82228	
Model χ^2	68.42***	
Pseudo R-square	0.2151	

Significance levels: ***=0.01, **=0.05, *=0.1

The final part will conclude and give some extensions and suggestions that can improve this research.

VII. Conclusions and Extensions

By using Taiwanese local fast-food outlets data, this paper has shown how some demographic factors affect the decision of fast-food outlets' location and the distance between McDonald's to MOS outlets, and also the other factors that affect the franchising decision of McDonald's outlets. Interestingly, not all results are consistent with the past theoretical and empirical works.

In my first part of this research, demographic factors, my regression results have shown that both population density and transportation have great positive influence on the specific

district's fast-food outlet numbers. It means that in a district which is densely populated or contains an important transport station, fast-food firms are more likely to set up an outlet. For a restaurant business, more crowded areas means more consumers, and it is reasonable that fast-food firms tend to set up their outlets at districts with high demand.

Also, the age factor is consistent with the past empirical works, showing that fast-food firms like to set up outlets at districts with more young people. The reason might be highly correlated with the popularity of fast-food among teenagers and children.

The education factor is negatively related to the dependent variable, and it is also consistent with past thesis, which means that firms like to set up an outlet at a district with more low-educated people. According to past literature, the reason is that low-educated people prefer quick and cheap food services to expensive restaurants.

However, the sex factor shows a quite different result from the past literature. A negative effect on the sex factor means that, unlike other foreign countries, Taiwan's fast-food firms like to set up restaurants in districts with more women. It is possible that Taiwanese females prefer consuming fast-food more than males. Another possible explanation is that, the size of fast-food meal in Taiwan is much smaller than western countries; men usually eat more and are not be satisfied by fast-food meal in Taiwan.

In the second part of the distance-to-the-nearest-competitor model, this paper has shown that large markets would separate McDonald's and MOS geographically, which is consistent with past literature. In a geographically large market, both firms would locate far away from each others to make themselves a local monopolist. For MOS, since it is the second fast-food firm in Taiwan, avoiding competition with McDonald's let MOS dominate the minor market.

The market concentration proxy, ***HHI***, shows a significantly positive sign in this model if appropriate distance is controlled, which means MOS would keep away from

McDonald's if the market is highly concentrated and competitive.

The most interesting result is the age factor, ***Pct_Child*** showing a significantly positive sign. It means that MOS tend to move away from McDonald's in a district with high proportion of children. The reason is that most children like McDonald's more, for McDonald's provide toys with specific meals and playground in their outlets. Therefore, facing a lower degree of substitution, MOS would tend to keep away from McDonald's in a district with more children.

In the final part, franchising of Taiwan McDonald's outlets, this paper classifies services into observable and unobservable ones. Totally four services dummy, ***24Hrs***, ***WIFI***, ***Drivethru***, and ***Playground*** are included. Also, ***Population*** variable is used as a proxy for demographic factor. ***Pct_Men*** and ***Attractions*** are control variables.

The probit regression results have shown that the ***Population*** variable is negatively correlated with the outlet's ownership dummy. It means that if the district is more populated, McDonald's prefer setting up a company-owned outlet rather than franchising it. In fact, according to my primary data, urban areas, such as Taipei city, there are only company-owned outlets. Because of the high demand and profitability in urban areas, McDonald's tend to manage these outlets by itself, and not sharing the profits with franchisees. On the contrary, sparsely populated areas usually means high monitoring costs for running a company-owned outlet. McDonald's franchise these outlets and take advantage of the local knowledge of franchisees.

As for the outlet's service factors, the observable service factors are not significant. The only significant and reasonable variable is ***Drivethru*** dummy, which shows a positive sign. Since drive-through is considered an unobservable service because the drive-through staffs' effort is hard to supervise for McDonald's headquarter, outlets that provide this kind of unobservable service are more likely to be franchised.

In fact, some managers told us about some important information considered by the headquarter before the company determine to set up a new outlet, including estimated annual revenue and expense, location of neighboring competitors, and transportation conditions, etc. Since some of the data are hard to acquire, this paper tries to explain the research problems using restricted data as much as possible. However, the regression results can still make contributions for economic analyses of fast-food industry location strategies.

Finally, since my data is a cross-sectional data, this paper assumes that the demographic and service variables are unchangeable in the short-term. However, by using this method, this paper ignores the fixed effect of different firm's properties, which might cause biased results. Panel data can deal with these kinds of problems easily and efficiently. Therefore, for further research of this topic, it is suggested that panel data be used to control the fixed effect, which requires time to record the data.

Appendix: Questionnaire 1

Questionnaire of McDonald's Outlet Franchising Information

Background Information

Outlet's Name：_____

Interview Time：

Successful Interview：☐First-time ☐Second-time ☐Over Third-time

Introductory Remarks

Hello! This is the Department of Economics of National ChengChi University. Would you mind if we ask you some questions for academic purposes? Could you put me through the manager if he is available now? Thank you.

(If the manager is not available)

When is the manager on duty?

---

1. Is your outlet franchised or owned by company?
   (Franchised→2. Company-owned→8.)
   ☐Franchised ☐Company-owned
2. Do you own other McDonald's franchised outlets? (Yes→3. No→5.)
   ☐Yes, _____outlets. ☐No
3. Can you tell us the names of other outlets?

---

4. Do you decide on different strategies for each of your franchised outlet?

---

5. What kind of job have you had before you joined the McDonald's?

☐Public Employees ☐Finance ☐Business ☐Construction ☐Electronics ☐Services
☐Information ☐Manufacturing ☐Communications ☐Transportations
☐Agriculture and Animal Husbandry ☐Freelance ☐Homekeeper
☐Human Health and Social Work Services
☐Student ☐Retired ☐Unemployed ☐Others_____

6. Can you briefly describe your motivation of joining McDonald's?

---

7. How did you acquire the outlets you owned now?

☐Self-owned ☐Rent ☐Distributed by company

8. Are there any features of your outlets different from other franchisees?

----------End of the franchised section----------

9. How many outlets have you managed totally?
   (Over two outlets→10.)
   _____outlets.
10. Can you tell us the names of other outlets?

_____

11. How did the headquarter arrange your transfering between different outlets?

_____

12. Compared to the franchisees, are there any restrictions for company-owned outlets management?

_____

---------- End of the company-owned section----------

Reference

Anderson, S. P., De Palma, A., & Thisse, J. F. (1992). Discrete choice theory of product differentiation. MIT press.

Blanck, H. M., Yaroch, A. L., Atienza, A. A., Sarah, L. Y., Zhang, J., & Mâsse, L. C. (2007). Factors influencing lunchtime food choices among working Americans. *Health Education & Behavior*.

Brickley, J. A., & Dark, F. H. (1987).The choice of organizational form the case of franchising. *Journal of financial economics*, *18*(2), 401-420.

Chan, T. Y., Padmanabhan, V., & Seetharaman, P. B. (2007). An econometric model of location and pricing in the gasoline market. Journal of Marketing Research, 44(4), 622-635.

Chen, H. H. (2011). A Study of Taiwan Fast Food Industry Strategic. *Journal of Sport, Leisure and Hospitality Research*, 6(1), 29-44. (in Chinese)

Chen, Y. H., Lin, W. Z. (2010). A Study of Brand Rights of Transnational Fast-food Chain Stores. National Kaosiung Marine University. (in Chinese)

d'Aspremont, C., Gabszewicz, J. J., & Thisse, J. F. (1979). On Hotelling's" Stability in competition". Econometrica: Journal of the Econometric Society, 1145-1150.

Eckert, A. (2013). Empirical studies of gasoline retailing: A guide to the literature. Journal of Economic Surveys, 27(1), 140-166.

French, S. A., Story, M., Neumark-Sztainer, D., Fulkerson, J. A., & Hannan, P. (2001). Fast food restaurant use among adolescents: associations with nutrient intake, food choices and behavioral and psychosocial variables. *International journal of obesity and related metabolic disorders: journal of the International Association for the Study of Obesity*, *25*(12), 1823-1833.

Greene, W. H. (2003). Econometric analyses. Pearson Education India.

Hsu, L. T., Jang, S., & Canter, D. D. (2010). Factors affecting franchise decisions in the restaurant industry. *Journal of Hospitality & Tourism Research*, *34*(4), 440-454.

Hu, G. H. (2002). The Study of the Development and Effects of Western Fast-food Chains in Taiwan: A Case Study on the Development of McDonald's in Taiwan. *Communication and Management Studies*, 239-253 (in Chinese)

Hunt, S. D. (1973). The trend toward company-operated units in franchise chains. *Journal of Retailing*, *49*(2), 3-12.

Hunt, S. D., &Nevin, J. R. (1974). Power in a channel of distribution: sources and consequences. *Journal of Marketing Research,* 60, 186-193.

Irmen, A., & Thisse, J. F. (1998). Competition in multi-characteristics spaces: Hotelling was almost right. Journal of Economic Theory, 78(1), 76-102.

Lafontaine, F. (1992). Agency theory and franchising: some empirical results. *The RAND Journal of Economics*, 263-283.

Lee, J., & Mannering, F. (2002). Impact of roadside features on the frequency and severity of run-off-roadway accidents: an empirical analyses. Accident Analyses & Prevention, 34(2), 149-161.

Lin, M. H. (1986). A Study of Fast-food Chain Industry Marketing Strategy. *Unpublished Master Thesis.* Chung-Yuan Christian University, Department of B.A. (in Chinese)

Lu, T. C. (2009). Effects of Country of Origin Image and Exotic Food Image on Purchase Intention. Master Thesis. Kaohsiung Hospitality College, The Graduate School of Hospitality Management (in Chinese)

Maruyama, M., & Yamashita, Y. (2010). The logic of franchise contracts: Empirical results of Japan. *Japan and the World Economy*, *22*(3), 183-192.

Netz, J. S., & Taylor, B. A. (2002). Maximum or minimum differentiation? Location patterns of retail outlets. Review of Economics and Statistics, 84(1), 162-175.

Norton, S. W. (1988). An empirical look at franchising as an organizational form. *Journal of Business,* 61, 197-217.

Norton, S. W. (1995). Is franchising a capital structure issue? *Journal of Corporate Finance,* 2, 75-101.

Oxenfeldt, A. R. & Thompson, D. N. (1968). Franchising in perspective.*Journal of Retailing, 44*(4), 3-20.

Paeratakul, S., Ferdinand, D. P., Champagne, C. M., Ryan, D. H., & Bray, G. A. (2003). Fast-food consumption among US adults and children: dietary and nutrient intake profile. *Journal of the American Dietetic Association*, *103*(10), 1332-1338.

Robbins, L. W., & Haas, T. P. (1981). Simulated Behavior of Fast Food Restaurants under Alternative Cost/Volume Conditions. American Journal of Agricultural Economics, 63(1), 146-152.

Rydell, S. A., Harnack, L. J., Oakes, J. M., Story, M., Jeffery, R. W., & French, S. A. (2008). Why eat at fast-food restaurants: reported reasons among frequent consumers. *Journal of the American Dietetic Association*, *108*(12), 2066-2070.

Seim, K. (2006). An empirical model of firm entry with endogenous product-type choices. The RAND Journal of Economics, 37(3), 619-640.

Shane, S. (1998). Explaining the distribution of franchised and company-owned outlets in franchise systems. *Journal of Management*, *24*(6), 717-739.

Shepard, A. (1993). Contractual form, retail price, and asset characteristics in gasoline retailing. *The RAND Journal of Economics*, 58-77.

Smith, H. (2006). Store characteristics in retail oligopoly. The RAND Journal of Economics, 37(2), 416-430.

Thomadsen, R. (2007). Product positioning and competition: The role of location in the fast food industry. *Marketing Science*, *26*(6), 792-804.

Vuong, Q. H. (1989). Likelihood ratio tests for model selection and non-nested hypotheses. Econometrica: *Journal of the Econometric Society*, 307-333.