5th international conference on
opportunities & challenges in
MANAGEMENT, ECONOMICS & ACCOUNTING
29 – 31 August , 2019   Berlin, Germany

Retail Agglomeration Formats in Thai Grocery Market

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Abstract

Thai consumers have been shifting from traditional retail formats to modern retail formats and frequently do 'outshopping'. This has led to the decline of rural retailers. To improve this situation, the concept of developing retailers in market towns has been adopted. However, it is unclear what form (i.e. store format) this takes and on which factors (store image attributes and customer characteristics) the role depends. This study examines the effect of store image attributes and customer characteristics on retail agglomeration format choice for a regular grocery shopping trip. The conceptual framework is constructed following the stimulus-organism-response (S-O-R) model. The choice model is applied using the mixed logit approach. The choice set includes a traditional agglomeration retail format (TAF), a modern agglomeration retail format (MAF) and a non-agglomeration retail format (NAF). The results reveal that increases in store image attributes affecting the probability to shop at TAF and MAF with the same degree, while they have less effect on the probability to shop at NAF. The product quality, customer service level, and price are the most three important attributes affecting the retail agglomeration format choice.

Keywords: retail agglomeration, store format choice, grocery market, outshopping, Thailand

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1. Introduction

In the retailing context, retailers often locate next to other retailers in one place or in a nearby geographical area (Berman & Evans, 2013; Guy, 2006). When similar or different types of retailers gather in one place or nearby, they can be called 'retail agglomerations'. Teller (2008) defines retail agglomerations as multiple retailers clustering in both a planned (e.g. shopping centres) and unplanned (e.g. strip developments) manner.

The theory of cumulative attraction (Nelson, 1958) states that, 'A givens number of stores dealing in the same merchandise will do more business if they are located adjacent or in proximity to each other than if they are widely scattered'. Nelson also differentiated between two types of cumulative attraction: similar and complementary. Similar attractions draw customers because they provide alternatives and price competition, while the complementary attractions are dissimilar in type, but are compatible by their sharing of a

relatively high percentage of customers. The theory of cumulative attraction seeks to explain both the homogeneity and heterogeneity of retailers.

Firms co-locate to decrease labour and other costs, learn from other firms how to improve productivity, learn about customers from other firms which reduces the cost of searching for the optimal location and pool labour and other inputs (Rosenthal & Strange, 2001). Firms co- locate to attract customers searching for optimal product characteristics (Konishi, 2005), to provide a credible commitment to low prices (Dudey, 1990), to locate near customers attracted by the reputation of competitors (Chung & Kalnins, 2001). Retail agglomeration benefits customers by reducing their shopping costs (Ghosh, 1986) and minimising shopping endeavours in a multi-purpose shopping trip (Teller, Reutterer, & Schnedlitz, 2008). Several shoppers enjoy comparison shopping as a form of leisure activity (Ingene, 1984).

Thailand has been one of the emerging markets in Asia in recent decades. Thai consumers have been shifting from traditional retail formats to modern retail formats and frequently do 'outshopping', particularly from rural areas to town centres. This has led to the decline of rural retailers. To improve this situation, the concept of developing retailers in market towns has been adopted. However, it is unclear what form (i.e. store format) this takes and on which factors (store image attributes and customer characteristics) the role depends.

An opportunity exists in rural retailing to develop a retail format that may be able to effectively compete with the large modern retail stores in city centres. This study employs the idea of developing retailers in market towns (Findlay & Sparks, 2008; Phillips & Swaffin- Smith, 2004; Powe & Shaw, 2004). However, this study advances the previous work by explicitly studying the role of the store agglomeration.

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2. Methodology

A conceptual model is constructed following the stimulus-organism-response (S-O-R) model. The concept of 'store image' is used to construct the conceptual model, including: range of products, price, travel time, product quality, atmosphere, customer service, accessibility, and retailer reputation. The customer characteristics are also investigated, including: gender, age, the number of members, children and elders in a household, income levels, educational levels, the residential area, and car availability. The dimensions and components to measure store image in this study are derived from the prior studies by Lindquist (1974), Oppewal and Timmermans (1997), Tat Keh and Wei Teo (2001) and the recent studies on Thai market by Gorton, Sauer, and Supatpongkul (2011), Kelly, Seubsman, Banwell, Dixon, and Sleigh (2015) are validated through face-to-face in-depth interview.

The unit of analysis is a household in a regional city that does grocery shopping regularly. The stratified random sampling divided the population into an urban area and a rural area. Then, a random sample was drawn within each stratum by a simple random sampling in a store format. A systematic random sampling was applied by intercepting each household representative in order to maintain randomness. The chosen city is Nakhon Ratchasima province which is one of the regional cities in north-eastern Thailand. It consists of 2,600,000 people (around 830,000 households) and about 75% of the total population live in a rural area. The total sample consists of 1,521 households.

The mixed logit model (ML) is used to develop the retail agglomeration format choice model. The ML, so-called random parameters logit, differs from the multinomial model (MNL) in that it assumes one or some of the parameters are random, following a certain probability distribution. The choice probability of the ML is shown as

$$\text{Prob}(choice_{ns} = j \mid \mathbf{x}_{nsj}, \mathbf{z}_n, \mathbf{v}_n) = \frac{\exp(V_{nsj})}{\sum_{j=1}^{J_{ns}} \exp(V_{nsj})} \quad ; \quad j = 1,...,J \tag{1}$$

where:

$$V_{nsj} = \beta_n' \mathbf{x}_{nsj}$$

$$\beta_n = \beta + \Delta \mathbf{z}_n + \Gamma \mathbf{v}_n$$

$\mathbf{x}_{nsj}$ = the K attributes of alternative j in choice situation s faced by individual n.

$\mathbf{z}_n$ = a set of M characteristics of individual n that influence the mean of the taste parameters.

$\mathbf{v}_n$ = a vector of K random variables with zero means, known variances and zero covariances.

The observed part is represented by the term $\Delta \mathbf{z}_n$, while the unobserved part is reflected in the term $\Gamma \mathbf{v}_n$. The parameters to be estimated are the constant vector, β, the K×M matrix

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of the parameters Δ, and the non-zero elements of the lower triangular Cholesky matrix, Γ.

The choice set of the store formats consists of: (1) traditional agglomeration retail format (TAF), i.e. a fresh/periodic market; (2) modern agglomeration retail format (MAF), i.e. a shopping mall/hypermarket; (3) non-agglomeration retail format (NAF), i.e. a new community store. Choice experiment uses a technique, namely the stated preference (SP) technique, to collect data. As choice experiment is derived from consumer response under (quasi-) laboratory situations, it allows researchers to examine scenarios that are not readily observed in the market.

In terms of model building, the parameters in the mixed logit models are estimated using the simulated maximum likelihood (Stern, 1997). Then, marginal effects are examined the effects of store image attributes or customer characteristics on the retail format choice. The goodness-of-fit and hypothesis testing are used to validate the discrete choice models.

3. Data analysis and results

The total sample consists of 1,521 household representatives. Missing data are checked and cleaned. The missing data can be ignored because they represent less than 10% and do not occur in a specific non-random fashion. The samples indicate a majority of females compared to males. A household size mode is four persons (average 4.1 persons per household). Income levels are distributed similarly to a bell-curve across the samples. About 40% of the sample live in urban areas, while the rest are in suburban and rural areas.

Retail agglomeration format choice models have been developed. In the first model, explanatory variables consist of eight store image attributes: product range, product price, travel time, product quality, atmosphere, customer service, store accessibility, and retailer reputation plus nine customer characteristics: gender, age, family size, the presence of children in the household, the presence of elders in the household, household income, educational levels, car availability, and residential area. The second model is similar to the first model, but it consists of significant store image attributes and significant customer characteristics (at 5% and 10% significance levels if the sign of a parameter is correct). The second model is applied for further analysis, i.e. hypothesis testing.

The hypothesis tests are performed as follows:

H1: Marginal customers' choice probability for outshopping at a traditional agglomeration retail format (TAF) differs significantly from that for outshopping at a modern agglomeration retail format (MAF) with respect to changing in store image attributes (a range of products, price, travel time, product quality, atmosphere, personal service, store accessibility, and reputation of a retailer).

The results indicate that there is no evidence to support H1. Improving store image attributes for TAF and MAF will increase the probability to shop at both retail formats with approximately the same proportion.

H2: Marginal customers' choice probability for outshopping at a traditional agglomeration retail format (TAF) differs significantly from that for outshopping at a non-agglomeration retail format (NAF) with respect to changing in store image attributes (a range of products, price, travel time, product quality, atmosphere, personal service, store accessibility, and reputation of a retailer).

There is evidence to support H2, apart from the reputation of the store. The figures indicate that improving store image attributes for both TAF and NAF will increase the probability to shop at TAF slightly higher than the probability to shop at NAF.

Table 1: Coefficient of explanatory variables and model statistic

Attributes / characteristics	Alternatives	The 1st Model		The 2nd Model	
		Coefficient	SD	Coefficient	SD
Range	All	0.26886*** (3.60)	-	0.29263*** (3.57)	-
Price	All	-0.47954*** (-5.23)	0.79098*** (4.97)	-0.51042*** (-5.01)	0.93684*** (5.37)
Travel time	All	-0.20103*** (-2.75)	-	-0.22994*** (-2.86)	-
Product quality	All	0.76866*** (9.11)	0.64352*** (4.40)	0.86732*** (8.93)	0.82511*** (4.48)
Atmosphere	All	0.29653*** (4.05)	-	0.30880*** (3.87)	-
Service	All	0.64078*** (7.25)	0.96437** (2.57)	0.72581*** (7.23)	1.10940** (3.91)
Accessibility	All	0.39752*** (5.34)	-	0.43645*** (5.34)	-
Gender	TAF	-0.14771 (-1.20)	-	-	-
Age	NAF	0.34333** (2.40)	-	0.40744** (2.49)	1.16036*** (3.79)
Member	TAF	0.02183 (0.84)	-	-	-
Children	NAF	0.27280* (1.72)	-	-	-
Elder	TAF	0.03148 (0.39)	-	-	-
Income	MAF	0.30363*** (2.62)	-	0.27935** (2.20)	1.16369*** (4.88)
Education1	TAF	0.08271 (0.38)	-	-	-
Education2	MAF	0.03968 (0.34)	-	-	-
Residential area	TAF, NAF	0.26490** (2.40)	-	0.32772** (2.47)	1.08113*** (4.58)
Car availability	TAF, MAF	0.07480 (0.46)	-	-	-
Alternative specific NAF	NAF	-0.54498*** (-2.96)	0.62886*** (4.75)	-0.61180*** (-4.52)	0.89304*** (4.44)
Rho-square		0.0942		0.1059	
Log likelihood function		-1759.313		-1736.656	

Remark: ***, **, * are significant at 1%, 5%, 10% level. Random coefficient is normally distributed.
Value in (…) is Wald statistic, which is close to t-statistic.

H3: Marginal customers' choice probability for outshopping at a traditional agglomeration retail format (TAF) differs significantly from that for outshopping at a modern agglomeration retail format (MAF) with respect to differences in customer characteristics (gender, age, household size, family structure, household income, educational level, car availability, and residential location).

Table 2: Reporting the marginal effects of TAF and MAF

Attribute / characteristics	Alterna-tive	Coefficient (Wald statistic)	Marginal effect of TAF [TAF, MAF, NAF]	Marginal effect of MAF [TAF, MAF, NAF]
Range	All	0.29263*** (3.57)	[5.906%,-3.540% -2.355%]	[-3.541%,5.861%,-2.320%]
Price	All	-0.51042*** (-5.01)	[-9.428%,5.218% 4.211%]	[5.320%,-9.478%,4.158%]
Travel time	All	-0.22994*** (-2.86)	[-4.953%,3.035% 1.918%]	[3.032%,-4.909%,1.876%]
Product quality	All	0.86732*** (8.93)	[14.886%,-8.924%,-5.962%]	[-9.008%,14.851%,-5.843%]
Atmosphere	All	0.30880*** (3.87)	[7.385%,-4.435%,-2.950%]	[-4.432%,7.329%,-2.897%]
Service	All	0.72581*** (7.23)	[12.169%,-7.529%,-4.640%]	[-7.514%,12.153%,-4.639%]
Accessibility	All	0.43645*** (5.34)	[5.255%,-3.152%,-2.103%]	[-3.157%,5.226%,-2.069%]
Age	NAF	0.40744** (2.49)	-	-
Income	MAF	0.27935** (2.20)	-	[-3.145%,5.497%,-2.352%]
Residential area	TAF, NAF	0.32772** (2.47)	[-3.816%,2.327%,1.490%]	-
Alternative specific for NAF	NAF	-0.61180*** (-4.52)	-	-
Rho-square		0.1059		
Log likelihood function		-1736.656		

Remark: ***, **, * are significant at 1%, 5%, 10% level. Value in ( ) is Wald statistic, which is close to t-statistic.

There is evidence partially supporting H3 that residential area and income level affect the choice probability for outshopping at TAF differently from that for outshopping at MAF, whereas gender, age, family size, the presence of children in the household, the presence of elders in the household, educational level, and car availability do not support H3. This evidence supports the idea of the development of the TAF in the rural areas.

H4: Marginal customers' choice probability for outshopping at a traditional agglomeration retail format (TAF) differs significantly from that for outshopping at a non-agglomeration retail format (NAF) with respect to differences in customer characteristics (household income, age, educational level, gender, family size, residence location, and car availability).

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Table 3: Reporting the marginal effects of TAF and NAF

Attribute / characteristics	Alterna-tive	Coefficient (Wald statistic)	Marginal effect of TAF [TAF, MAF, NAF]	Marginal effect of NAF [TAF, MAF, NAF]
Range	All	0.29263*** (3.57)	[5.906%,-3.540%,-2.355%]	[-2.391%,-2.344%,4.735%]
Price	All	-0.51042*** (-5.01)	[-9.428%,5.218%,4.211%]	[3.977%,3.923%,-7.899%]
Travel time	All	-0.22994*** (-2.86)	[-4.953%,3.035%,1.918%]	[1.956%,1.915%,-3.870%]
Product quality	All	0.86732*** (8.93)	[14.886%,-8.924%,-5.962%]	[-6.121%,-5.935%,12.056%]
Atmosphere	All	0.30880*** (3.87)	[7.385%,-4.435%,-2.950%]	[-2.988%,-2.921%,5.909%]
Service	All	0.72581*** (7.23)	[12.169%,-7.529%,-4.640%]	[-5.179%,-4.920%,10.100%]
Accessibility	All	0.43645*** (5.34)	[5.255%,-3.152%,-2.103%]	[-2.135%,-2.090%,4.225%]
Age	NAF	0.40744** (2.49)	-	[-2.815%,-3.279%,6.094%]
Income	MAF	0.27935** (2.20)	-	-
Residential area	TAF, NAF	0.32772** (2.47)	[-3.816%,2.327%,1.490%]	[1.487%,1.736%,-3.223%]
Alternative specific for NAF	NAF	-0.61180*** (-4.52)	-	-
Rho-square		0.1059		
Log likelihood function		-1736.656		

*Remark: ***, **, * are significant at 1%, 5%, 10% level. Value in ( ) is Wald statistic, which is close to t-statistic.*

There is evidence partially supporting H4. The results show that age, and the residential area of customer's support H4; however, gender, family size, elders in the household, the presence of children in the household, income level, educational level, and car availability do not support H4.

4. Conclusion

4.1 Store formats (What form of store?)

This study sheds light on the development of retailers in rural areas. The best model shows the alternative specific constant for NAF is significant and negative. This indicates that most consumers viewed the TAF and MAF as superior to the NAF. The marginal effect analysis shows that improving store image attributes for TAF and MAF will increase the probability to

shop at both retail formats with approximately the same proportion. Furthermore, the marginal effects of the TAF and NAF for residential location indicate that consumers living in the countryside tend to shop at TAF and NAF more than consumers living in the cities. This gives customers an advantage in the catchment areas of the market town. Instead of outshopping further afield to city centres, customers in remote areas can shop at the market town which is relatively closer than the further city centres. The result supports the study in the market town in UK by Powe and Shaw (2004) that improving services i.e. supermarket, shopping in general, non-food shops etc. in market town can potentially encourage rural residents to visit their nearest market town.

There are forms of agglomeration retail formats in existing rural market areas, for instance, periodic markets, fresh markets, and shopping strips in market towns, which can be developed and improved. An alternative form that can be developed in the market towns is the improvement of shopping strips (the collection of small independent stores in a proximity area). This is similar to the past development in the market towns in Western countries (Findlay & Sparks, 2008; Phillips & Swaffin-Smith, 2004; Powe & Shaw, 2004). A study in the remote area in Thailand found that the hypermarkets are mostly inaccessible to the poor, despite their low price policies, and engaging entertainment (Ihara, 2013). Another form that could serve the poor in the remote countryside is to develop periodic markets. This may fit well in remote areas in Asian countries.

4.2   Store image attributes (Which attributes?)

Most store image attributes are significant in the retail agglomeration format choice model, apart from national or international retailer reputation. The customers' choice models indicate that among eight store image attributes product quality and service level are the first and second most important attributes affecting the choice probability of such three store formats. Improving the product quality and service level from a low to high level will increase the choice probability (approximately 12% to 15%).

The finding shows the older consumers have more opportunity to support the NAF compared to the younger ones. The TAF can attract low-income consumers who are existing NAF customers. Gender, education level, car availability, household size and family structure do not influence the choice probability among three formats. This finding indicates that households in rural areas have more opportunity to shop at TAF and NAF than households in urban districts. This implies that MAF may not fit with consumers in rural areas. This evidence supports the idea of the development of the TAF in market towns.

4.3   Managerial implication

Traditional store formats exist if they create and deliver value to customers. Goldman, Ramaswami, and Krider (2002) suggested that, at least in Asian countries, the development of modern retail formats might not be sufficient to replace traditional format shopping. In

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Thailand, studies (e.g. Banwell et al., 2012; Gorton et al., 2011; Ihara, 2013; Kelly et al., 2015) showed that traditional retail formats coexist with modern retail formats. In Thailand, a number of studies report that consumers regularly purchase fresh food at the traditional retail formats and packaged food at the modern retail formats occasionally (Banwell et al., 2012; Gorton et al., 2011; Ihara, 2013). For most Thais, particularly those in rural areas, the daily purchase of fresh food at the fresh market has become routine shopping.

4.3.1 Fresh market as the TAF

The fresh markets as the main traditional store format for Thai consumers should be developed both in product quality and customer service; as their main rivals, the hypermarkets, provide a similar shopping experience with better performance, more and more. On the one hand, product quality should be developed, such as using a cold chain network to keep perishable goods fresh (Salin & Nayga Jr, 2003), making the safety of products better and providing greater food diversity (Banwell et al., 2012). On the other hand, customer service, such as friendliness and helpfulness of staff, should also be improved. The study by Banwell et al. (2012) has shown that fresh markets are under pressure and are declining in number; they have been attempting to resist the competition from supermarkets by improving convenience, food variety, quality and safety. Ihara (2013) and Kelly et al. (2015) reported that traditional retailers responded to the opening of hypermarkets by installing air-conditioners, altering the store layout, changing opening hours, providing more hygienic produce or joining an existing convenience store chain.

To this end, the government has taken several remedial measures to enhance the competitiveness of traditional markets against the hypermarkets. The Thai government has introduced zoning laws, incorporated as The Town Planning Act and the Building Control Act, into the Retail and Wholesale Act since 2004. The zoning laws stipulated that stores with selling space of 300-4,000 square metres should be located at least 15 kilometres away from city zones (Ihara, 2013). Kelly et al. (2015) claimed that in the short to medium term Thais purchase fresh food at traditional and modern retailers, both of which retain market share. However, for longer term survival the traditional retailers may require government support. Such assistance may take the form of improvements in physical infrastructure and facilities, improving food distribution systems, rent subsidization (as the major cost factor), as well as the active promotion of fresh markets as healthy food sources and as repositories of Thai food culture.

4.3.2 Mom-and-pop stores and convenience stores as the NAF

Feeny, Vongpatanasin, and Soonsatham (1996) reported the huge success of the master franchise of 7-Eleven in Thailand. As a result, the impact of 7-Eleven on Thai retailing and Thai life has been enormous; 7-Eleven stores are everywhere. 7-Eleven has rolled out a smart card system, a bill payment counter service, even airline tickets can be purchased from the stores (Shannon, 2009). Key to their success has been in their strategic location, such as bus stops, together with bright lighting, cleanliness, efficient service and a limited

range of reliable goods. In comparison to their main rivals (mom-and-pop stores), which cater for similar shopping habits, most attributes for convenience stores are rated better than those of mom-and-pop stores, except for the price. An existing traditional retail format, such as the mom-and-pop store, should improve product quality as well as the customer service level as the first and second positions. The strength of the mom-and-pop store is only in its location, while other attributes are worse than its rival, the convenience store. Shannon (2009) has suggested that the new format discount convenience stores, which are principally small supermarkets, may be well suited to Thai consumers, who tend to shop frequently but spend small amounts each time.

4.3.3 Supermarket and hypermarket as the MAF

Over four decades, supermarkets have made the biggest impact of all on Thai retailing, especially when forming a part of larger shopping centre complexes. However, in the capital city, supermarkets reached saturation (Feeny et al., 1996) and had then spread into other parts of the country, particularly regional cities. Several attributes, i.e. product quality, customer service, store appearance/atmosphere, range of products of supermarkets and hypermarkets are rated the highest among formats. However, several customers perceive that these stores are difficult to access/park and it takes a long time to travel to the stores. Ease of access/parking and travel time should be improved, particularly traffic congestion (Laowagul et al., 2008) and availability of car parking (Sunalai, 2006) but these attributes seem not to have much relative importance to customers compared to other attributes. Evidence shows that major hypermarkets incorporate 'imitation fresh markets' into their formats: spatial layout, and spiritual functions such as aquariums of live fish, butchers and fishmongers cutting portions and trimming for customers' requirement, (Gorton, Sauer, & Supatpongkul, 2009; Isaacs, 2009). Highlighting one-stop shopping, both functional and hedonic, can increase the strength of supermarkets and hypermarkets, as Thai consumers perceive their shopping trips as family outings, entertainment, and an opportunity to observe new things and experiences (Ihara, 2013; Isaacs, 2009).

The main limitation of this research is that it uses only one Thai regional city, so it is difficult to generalise the findings to other countries and markets. The phenomenon of the store formats is also rather country-specific. Thus, a replication of the study in other retail locations and other cultures may reveal other findings.

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