

A Study on Commercial Power of Traditional Market

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Abstract

This study investigated commercial power theory of traditional market through the analysis of literature review. Consumers' store selection models are made up a theory based on normative hypothesis, theory of mutual reaction, utility function estimation model, and cognitive-behavioral model. Detailed models are as follows. Normative hypothesis based theory is divided into Reilly's retail gratification theory and Converse's revised retail gratification theory. Interaction theory is composed of Huff's probability gratification theory, MCI model and Multi-nominal Logit Model (MNL model). There are four models in retail organization position theory such as central place theories, single store position theory, multi store position – assign model, and retail growth potential model. In case of single store position theory, theoretical and empirical techniques have developed for a decision to optimum single store position. Those are like these, a check list, the most simple and systematic method, analogy, and micro-analysis technique. Aforementioned models are theoretical and mathematical commercial power measurement and/or model. The study has rather limitations because the variation factors included in formula are only a part of actual commercial power. Therefore, further study shall be made continuously to commercial power areas and variables.

Keywords: Traditional Market, Commercial Power, Theory of Commercial Power.

1. Introduction

This study investigated theory of commercial power in traditional market through the analysis of literature review. Consumers select their stores by theory and/or model: 1) theory based on normative hypothesis, 2) theory of mutual reaction, 3) utility function estimation model 4) Cognitive-behavioral models.

The theory based on normative hypothesis is divided into Reilly's retail gratification theory and Converse's revised retail gratification theory. Interaction theory is composed of Huff's probability gratification theory, MCI model and Multi-nominal Logit Model (MNL model).

2. Consumers' Store Selection Model

2.1. Normative Hypothesis Based Theory

Normative hypothesis based theory may be effective to decide upon the ideal place in commercial power analysis. Representative theories are known as a theory of retail gravitation by Reilly as well as a central place theory by Christaller(1933) & Losch(1940) in many normative models.

2.1.1. Reilly's Theory of Retail Gravitation

Christaller (1935)'s central place theory made researchers recognizing problems of the nearest center hypothesis in central place theory due to a lack of empirical evidence. That is, the difference from the distance not exceeding threshold level can be neglected in selecting a store, and distance variables make change from absolute variable to relative distance (Clark & Rushton, 1970). Consumers detour the nearest store to get better sales opportunity. For instance, consumers may save the cost at the cost of time, such as transportation cost, and shall move up to far store considering better quality, product assortment and store images. When the difference from relative distance to alternative store is lower than identification level, buyers may move to the place with agglomeration of store. So, consumers' purchase movement shall be decided not by distance with store according to central place theory but by store's retailing gravity.

Consumers may select either one of two towns and/or stores apart for buying purpose (Reilly) and breaking point is thought to be a point of difference between both towns. In other words, a consumer at point of difference may think that both towns are reasonable for his movement for buying to think of difference.

Reilly's retail gravitation theory says that gravitation in buying power of small town around branch in the middle of large town is proportional to population size between both towns and to be in verse proportional to square of distance up to both towns to small town.

Unlike the central place theory, conceptualizing commercial power with considering population and distance border can be a first one as a retail gravitation theory that absorbs consumers' space movement with stores agglomeration and store space as the center.

2.1.2. Converse's Revised Retail Gravitation Theory

Reilly's retail gravitation theory made change to explain buying gravitation not between both towns but between shopping centers in town in three ways (Davies, 1977).

First, through the detail definition for population size and distance that establish commercial power border, the population size of both towns are regarded as an attraction factor and distance mileage as a resistance factor.

Second, shortening of shopping trips is thought to be a distance – decay function, and the relation between distance and buying behavior was considered as a negative exponential curve.

Third, there are three progresses to identify the relation between consumption expenditure and retail sales. Not only Converse's revised retail theory but also Huff's probability retail gravitation theory describes these progress of the theories in detail.

Both towns have shown the competing border area depending upon buying of either town A or town B. It is better to apply not to all of products but to advance buying product and special product. The branch from Converse model can exist between all of the areas, and the borders of commercial areas connected. A point where horizontal axis and curve cross is a grip on the border of commercial power of each town as well as the breaking point of both towns. The gratification theory of Reilly & Converse and Huff shows much difference from central place theory in three aspects.

First, central place theory describes a growth process of shopping center and/or commercial area to help select the best place, while retail gratification theory does place demand concerning consumers' space movement and selection of stores.

Second, retail gratification theory has uncertain concept system than central place theory has, and the former is theoretical system connected by mathematics formula.

Third, central place theory describes marketing behaviors that form a hierarchy structure of retail organization, while retail gratification theory can be applied to consumer's buying behavior, movement of the population, forecast of traffic and other areas.

Meanwhile, the retail gratification theory of Reilly & Converse were taken criticism (Huff, 1964):

First, consumers in and out in breaking point have different buying attitude on competing towns and stores because of different distance to be neglected and to be difficult to estimate intake of goods and/or services.

Second, when breaking point rule is used to set commercial power of 3 or more stores in a place, commercial power can be overlapped. The breaking point means consumer's impression on adjacent town and/or store, so that overlap of commercial power is not permitted.

Third, Reilly's parameters shall not be used for all kinds of buying behaviors in same way. This is because parameters make change depending upon buying behavior and same store may have different size of commercial power depending upon kind of goods.

Not only Reilly but also Converse made correction and supplemented to apply their retail gratification theory and to make Huff's probability theory. But, Huff's model can be classified to be a retail gratification theory, and consumers select a store not by distance but by total utility to classify differently from aforementioned retail gratification theory.

<Table 1> Retail gravitation theory and central place theory

Item	Retail gravitation theory	Central place theory
Analysis direction	Explain movement of consumer place and demand on store selection	Explain optimum place selection and commercial power growth process
Concept	Unclear concept system and low rigidity of the hypothesis	Rigidity of hypothesis and clear concept system
Scope of application	Consumer's buying behavior, movement of the population, and forecast of traffic volume (high use of distribution business)	Marketing behavior from point of view of distribution economy (make use at geography and urban planning).

Retail gravitation theory of Reilly & Converse has been given criticism (Huff, 1964):

First, not only consumers in breaking point but also the ones out of breaking point may have different buying attitude toward competing town and store because of different distance to be neglected and to be difficult to estimate intake of the demand on goods and/or service.

Second, rule of breaking point that sets commercial power of 3 or more stores at a place may produce overlapping. Consumers may think of adjacent and competing towns and/or stores indifferently so that overlapping of commercial power shall be removed.

Third, Reilly's parameters shall not be used for all the kinds of buying behaviors in same way. The parameter may vary depending upon buying behavior, and the same store may have different commercial power depending upon the kind of goods.

Huff's probability model is a suitable to real situation. It was revised and supplemented of retail gravitation theory of Reilly & Converse. Huff's probability model can be classified as a retail gratification theory, but the model is processed by the hypothesis that consumers' store selection is from not just by distance but by total utility. Therefore, this model should be categorized into an interaction theory unlike those two retail gratification theories.

2.2. Interaction Theory

2.2.1. Huff's Probability Gratification Theory

Huff's gravity model¹ estimated the scope of sales and commercial power at a newly opened store to make use of gravity model as for estimating the relation between retail environment variables having influence upon sales, and

¹ Gratification model that was introduced by Reilly in 1929: In 1950s, Huff and Stouffer and others introduced formula of current gratification model to develop concept. Thereafter, Wilson (1967) added concept of entropy to gratification model to have influence upon urban plan and transportation. The gratification model has been used at the economics, geography, urban planning and demographic to investigate relation with movement of population, economy and industry, consumers' behavior in urban town, buying patterns, distribution of retail business, and areas of background. Distribution volume increases at more population of both areas and decreases at far distance between both areas. In other words, distribution volume shall be proportional to population and inversely proportional to distance to be same as gratification rule that is said to be gratification model and/or interaction model.

store outcome and others based on probability model. Probability model is used to investigate spatial behavior patterns of consumers empirically who buy in target commercial area. In other words, probability model reflects not only consumers' expenditure patterns but also consumers shopping patterns to forecast the scale of sales and commercial power of consumers.

Probability store selection model includes Huff's model and others, and they have something in common that consumers' store selection is not deterministic but probability phenomenon. A customer having high loyalty of a store does not make use of one store only to visit another store in accordance with competing store's marketing strategy. Travel time from residential area to the store is used instead of Reilly's distance variable to estimate size of commercial power that includes consumers' special demand movement and each commercial center in towns. Reilly's model may be good to set scale of commercial power between towns and not to make use at decision making of commercial power in towns. Discovery of breaking point may be of value. Huff introduced probability of gravity model to produce new model.

Huff's model is:

Huff described consumers' store selection by probability, and the probability in consumer's selection of many shopping centers can be decided by utility and benefit of the store. The probability was thought to be the same as a ratio of utility size in specific store of aggregation from the utility supplied by all of stores.

Huff's commercial area can be geographically limited to have a potential customer who has probability larger than zero to sell commodity and/or service that enterprise and/or business group gives. Huff's model made a model for consumer's space selection behavior between many commercial areas in town that differ a little from relation between competing towns of Reilly & Converse.

Huff's model can estimate commercial power as well as probability to buy from another place in commercial area. Contour map of probability to buy from another place based on sales place of 'j' can be made. The model can estimate number of customers by each of competing facility. It can forecast the change of consumer's buying behavior (change of customer number) depending upon the change of sales facility.

The study forecasts the changes of customer's buying behavior (changes of customer number) depending upon change of sales facilities. In Japan, parameter λ of 2 of Huff's model was used to inspect in accordance with large scaled retailer law.²

2.2.2. Multiplicative Competitive Interaction Model (MCI model)

Multiplicative competitive interaction models can be used from the point of view in Huff's model. Huff's model excluded some of variables to simplify model and to make serious specification bias at commercial areas investigation and selection. When variables excluded are not independent from travel time, estimation of parameters may be difficult. In other words, absolute value of parameters of travel time shall be strengthened to let commercial area controlled by travel time. This is because collinearity among comfort, satisfaction and travel time can be made. Other factors than scale of store, for instance, assortment, price, atmosphere, and decoration of store shall be considered, and other variables than travel time, for instance, travel expense, travel safety, comfort at movement, and convenience of travel shall be done (Youn, 1997). MCI model can replace Huff's model.

2.2.3. Multi-nominal Logit Model (MNL model)

MNL model is based on Luce's choice axiom to describe choice behavior by using aggregate choice data: Some of scholars said limitation on description of behavior of each one of consumer. Consumers' choice of store shall rely upon known components and unknown components. Consumers' selection of stores shall be decided by known components and unknown components of the stores. Aforementioned model means that relative frequency at

selection of alternative B relies upon construction of alternative A suggested to an individual to be marginal probability of selection of either one of alternative A competing.

2.3. Direct Estimation Model of Utility Function

Direct estimation model of utility function that is MCI model, does not differ from MNL model to revise and supplement MNL model. Being different from remaining models, direct estimation model of utility function collects material in different way to solve problems. In other words, materials collected by communication in the past are not used to find out the utility function of consumers by using either conjoint method or logit techniques.

Obtaining of material by experiment has advantage not relying upon the past material to find out utility function, and the estimation of coefficient in parameter does not reflect the effect of existing special structure. Well-designed experiment and design allows consumer to cognize sensitivity of attributes of the store and to evaluate the effects of attribute of new store by using important attributes, and to estimate market share of innovative retail organization that does not exist in material in the past.

2.4. Cognitive-Behavioral Models

Change of consumer's preference on place cannot be explained by the theory of direct estimation or interaction. The theories are said to allow consumer to take reasonable actions with similar behavioral system, and to have quite different social and economic motives, individualism, level of information, and motivation level, so that the explanation and forecast on store selection by the size of parameters may not be reliable.

Garner (1967) was the first one who was interested in consumers' psychological information processing and its influence upon consumer's retail stores selection including consumer's attitude toward stores, motivation on special product and stores, and research on consumers' data processing mechanism. In addition, consumer's image on women garment retail store was estimated to forecast the scale of commercial power.

Downs developed Garner's technique to find out the variables having relations with images of retail stores. Consumers' knowledge on retail structure had influence upon consumer's place selection to classify men's place into action place and activity place (Horton, Reynolds). Action place means the place of interaction to establish considerable knowledge by consumer's personal preference to interact with space, while activity place facility and/or space that an individual regularly visits and transits.

Therefore, consumer's demand on space and/or selection of store may vary depending upon individual's knowledge on the space and scope of store may vary depending upon size of the knowledge. Demand on space may vary depending upon consumer's learning on the space.

Studies on consumers' space behavior can be supported by quantitative approach of either MCI model or MNL model, and qualitative approach such as consumer's perception structure, state of learning, image formation and attitude to have complete description system.

3. Theories on Places of Retail Organizations

3.1. Central Place Theories

Christaller in Germany announced central place theory for the first time by his writing in "Die zentralen Orte in Suddeutschland" in 1933. In 1950s, scholars paid attention to his theory to start to research.

Christaller investigated central place theory more than 30 years to complete theory frame. Consumers were assumed to move all of the directions and to move in different way by transportation system and administrative areas and to have different movement and central place system: In 1950, Christaller revised his model to give theory and to elevate completion of the theory.

He thought of supplementary theory in addition to market principle to give not only transportation principle but also administrative principle. The transportation principle puts central place as many as possible on the roads connecting major towns to construct transportation lines the most effectively.

And, administrative principle put background places according to purposes of direction and/or control. He said that central place system could be decided by interaction. Many researchers made effort to make Christaller's central place theory practical.

First, central place means the place that supplies goods and services to neighboring places. Second, central function includes wholesale and retail service, transportation, finance, education, administration and services, and excludes factory and housing. Third, background place means adjacent places making use of neighboring place, influence area, power area, commercial area and central area and others. Fourth, minimum requirement means minimum demand and/or commercial power to keep central function. Fifth, central place establishment condition means minimum requirement to be scope that goods and services reach. Lastly, scope that goods can reach means '0' of sales quantity.

Central place theory can be described: First, central place can be formed when minimum requirement is within scope of reach of goods. Second, central place has single center of round shape and hexagonal shapes of many centers to lessen competition as much as possible. Third, central place can be divided into high level central place and low level central place depending upon function of the place. Central place theory has three prerequisites: First, target place is a homogeneous flat field to move into all of directions. Second, studies on buying power are distributed evenly and continuously. Third, consumers take a reasonable action according to principle of movement of minimum distance.

Central place theory includes:

First, central place can supply goods and services to background places and all of the towns play central place functions. Central place function shall satisfy minimum requirements. Scope of reach of goods shall be larger than minimum requirement. The area to sell goods shall have round shape according to prerequisites. However, a lot of central places may complete each other to make hexagonal shape. Central place function may have different background place depending upon function.

Large scope of reach of goods and minimum requirement is said to be high level central function, while small scope is done to be low level central function. Overlap of different sizes of hexagonal shape (background places) may produce central places having different levels to be high level central place that has all of functions of low level places. Central place having low level central function is said to be low level central place.

Rule of a certain distribution (increase and/or decrease at specific rate in accordance with number of times) exists at scale and number of the town and distance between towns). Larger scale in town, less number and far distance between towns and more number of the functions. Smaller size of the town, more the number and closer distance between the towns and less number of the function (narrow background area).

Scope of central place theory says distance to arrive at store at central place maximum distance for consumer to sell the commodity. Each commodity may have scope, and even the same commodity may have different scope depending upon central place. The scope shall have a circle that has not circled with same distance at all of directions based on central place and have a circle according to assumption of central place theory. Every place shall be given service from central place, so that overlap is needed. The overlapped area is divided into two to have hexagonal arrangement. Such a central place may have hexagonal impact area that is called scope of central place (Christaller).

The nested principle of central place was used (Christaller). The nested principle describes nesting of central places with low levels in impact area (background place). K-value system was used to describe nesting of number of central places with low level by multiple of K-value. Christaller described nesting principle between central places at $K=3$, $K=4$ and $K=7$.

3.1.1. Marketing Principle: $K=3$

Marketing principle says division of central places to supply goods and services to wide areas from less number of central places. One of low level central place is influenced by three of immediate higher central places to divide into one third and to nest into the nearest and immediate higher central place. Impact area (background place) shall include not only one of immediate low central place (central place of immediate low level) but also background area to nest not only immediate low central place divided into one third but also six of background places to nest three of immediate low central place.

$$K = 1 + (1/3 \times 6) = 3$$

Distance with high level central place shall be $\sqrt{3}$ times distance with high level central place, and number of central place of low level central place increases 3 times.

3.1.2. Traffic Principle: K=4

Traffic principle puts low level central places on the road connecting large towns (high level central place) to seek for traffic convenience and to construct effective transportation net. In traffic principle, six of low level central places are placed at the center of hexagonal line of high level central place to maximize effectiveness of transportation. Hexagon of high level central place includes one of immediate low central place and background to have immediate low central place divided into half and background place.

$$K = 1 + (1/2 \times 6) = 4$$

According to traffic principle, distance with high level central place shall be 2 times distance with immediate low central place, and number of central place at low level place from high level central place increases geometrically 1 : 4 : 16

3.1.3. Administrative Principle: K=7

Administrative produces special arrangement not from economic point of view but from political point of view, and administrative control does not divide impact area into each of central place to nest all of six of immediate low central places within area under influence of high level central place.

$$K = 1 + (6) = 7$$

Distance with high level central place shall be $\sqrt{7}$ times distance with immediate low central place, and number of central place at low level increases at 1 : 7 : 49 ...

Scholars discussed as follow: Each commodity has a certain level of demand, and consumers select buying pattern with the least expense of buying (Ghosh). Consumers visited the nearest shopping center to buy single commodity (Chrisaller), and consumers with advantage of multi-purpose buying like to visit the nearest shopping center so that time and space of buying behavior of each one of consumer need to research (Ghosh). Each one of consumer shall keep inventory from point of view of time. Buying of commodity supplements inventory to produce inventory keeping and storing cost, so that cost at small inventory increases proportionally. Sales in small quantity may decrease inventory cost and increase visit cost.

Reasonable consumers' maintenance cost and visit cost for buying that decide upon optimum frequency of visit may vary depending upon consumer's location to have relations with consumer's residing place. Considering multiple kinds of commodities, buying visit frequency can be combined with outcome of multi-purpose buying opportunity to decide upon limit. An integrated model of special behavior of consumers can be assumed by inspecting time and space of buying. The model made optimum space and time pattern of buying visit considering movement expense, prices of commodities and inventory maintenance cost.

An empirical study on structural regularity of central place (Christler) was done by comprehensive case study of both Berry and Garrison, and the regularity was found to exist despite absence of isotropic space of Christler. Not only the range of a good but also threshold reorganized central place theory to develop hierarchical system even at absence of uniformity of buying power that is prerequisite of hexagonal arrangement. The central place theory examined hierarchical structure of inter-urban relationship so far, and their study described intra-urban hierarchy at towns to expand area of central place theory. The empirical study regarded central place theory not to be theory of patterns of trade areas but to be theory of structures of trade areas.

3.2. Theory of Single Store Site

Simple and systematic methods of check list method, analog method and micro-analytic technique were used:

3.2.1. Check List Method

Check list method investigates having influence upon sales and site cost to evaluate relative values by reference list and to select optimum site. The method has advantage to interpret sites and the selection of optimum site by one stage, and does not consider interaction effect with other factors of replacement sites. Assessment factors include social and demographic characteristics, competing situation and consumer's expenditure patterns, and some of scholars give standardized check point.

3.2.2. Analog Method

Analog method developed by Applebaum & Cohen(1961) is said to be delicate than check list method. Inspect type of stores, sales outcome, business types and market factor with help of retail department to survey drawing power from different areas and to estimate sales and commercial power of each one of replacement site. Optimum site shall have the highest expected outcome.

3.2.3. Micro-Analytic Techniques

Micro-analytic technique is more delicate than aforementioned two methods: Nelson's micro-analytic process is:

- ① Inspect income, number of household and competition patterns by each commercial power.
- ② Consider scale of remaining retail system, transportation system and access.

At the opening of new store, investigate consumer's expenditure pattern and space movement according to Nelson's saying.

In the case of downtown layout, inspect potential commercial power considering commutation traffic, movement of economic population to recognize potential economic power and to get exact result than estimation of commercial power by using traditional manpower theory. Micro-analytic technique, another kind of technique, has Mackay simulation. Mackay said that location selection technique in his previous studies was subject to be a dangerous assumption of consumer's single purpose buying, and single purpose buying shall not be affected by adjacent retail mechanism for consumer at 'O' not to move up to store 'D' and to buy commodity 'I'.

The one who does multi-purpose buying may want to move up to store 'D' where he can buy not only commodity II but also commodity III.

So, sales potential cannot be estimated at either existing place or latest place not relying upon actual assumption on consumers' preference and/or shopping patterns. He said that consumer's buying pattern is based on multi-purpose buying to give single location selection model that made use of not only discriminated analysis but also Monte Carlo simulation techniques.

3.3. Multi-Store Position-Assign Model

Multi-store position theory is thought to be one of MCI model. MCI model introduced probability that consumers bought at retail store I to forecast market share and sales of a store: On the other hand, multi store position-assign

model expanded the theory. Most of the models are included in position assign model. The position assign model assigns the demand for store selection and position to optimize a standard. The model is used to decide upon commercial area of each store and to forecast sales and profit. The position assign model has advantage to evaluate position draft systematically and to select maximization of outcome of retail business. The model is used for the opening of multiple stores numbers in the same market. And, the model evaluates the effects of market share and profit at the change of position and store type.

3.4. Retail Growth Potential Model

Retail growth potential model investigates economic flow between residential district and commercial district, and market potential of each commercial district, and decides upon position and scale of commercial facility that can satisfy consumption activity of community residents at present and in the future. The model deals with the demand on shopping goods of residence to make use of potential of gratification theory. The model is used to investigate interaction theory application. The potential means strength between zones that mutual reaction can be done. The model is based on theory of potential that is strength of interaction between zones. High gratification may increase potential at zone i to be low at far distance between district i and j ,

Market power at a commercial area may be influenced by followings:

- ① Commercial area's attractiveness
- ② Consumers' scale and living standard
- ③ Competing commercial area's attractiveness
- ④ Consumer's near distance buying tendency

External supply of material on consumption and expenditure scale of specific residential area may help forecast commercial area's sales in the future by using the model. And, additional demand of commercial facilities at the increase of consumers' income in the community can be predicted to decide the scale and place of commercial facility in accordance with a facility and policy.

The model has problems: Consumers move to commercial area with many goals, and the model considers goods buying movement only.

Second, the model makes use of movement time that is scale of separation of space not to account for the effects of movement cost upon buying pattern.

3.5. Setting of Commercial Area Borders

The models and theory can be used to set geographic border of both commercial areas. The models investigated not setting of geographic border of commercial areas but commercial areas subject to consumers' special demand behavior and site patterns to decide upon optimum place and proper scale in accordance with commercial area.

Two kinds of border settings can be used to verify geographic commercial area when a retail place is already decided:

- ① Applibaum making use of market penetration and competition advantage;
- ② Batsell by making use of space concept.

Applibaum said customer drawing that is an empirical method. Applibaum developed by using market penetration method:

- ① Find out consumer per sales each week to interview and to get customer's taste and/or buying habit;
- ② Identify customer on the map. Make a circle on customer distribution to take number of customer each distance.
- ③ Make out population and land diagram by using secondary data.
- ④ When sales and selling power are proportional to number of customer, get sales per transaction and selling power by using both maps.

⑤ Divide not only sales per distance but also selling power by population per distance of population and land use diagram to get sales per distance and person.

⑥ When commercial area is divided to be primary commercial area, secondary commercial area and third commercial area, estimate distance between customer's residence and store of customer distribution to select the nearest place and to distinguish primary commercial area and secondary commercial area by accumulation and to make contour.

⑦ Get market penetration and/or market share of sub market by using census material.

Make use of Batsell research. Scope of space of commercial area means place around distribution point exceeding a certain rate of total sales of retail business. Identify a dot on the map by a series of watches reflecting phenomenon to concentrate phenomenon dots near distribution point and to disperse distribution far from distribution point. Produce border line including phenomenon having a certain accumulation to have area extent that is inside the border.

Identify border of commercial area: i) Verify exact place of extreme dot by using coordinate, ii) Estimate distance from distribution point to extreme dot by map. Replace distance by transportation time. iii) Give grade of each extreme dot in order of near distance from distribution point. iv) Find out extreme dot that belongs to predetermined accumulation cost, v) Identify extreme dot that is placed the most far away from each direction, and connect them to make scope of space of commercial area.

vi) Do curve crossing to do smoothing of border line of v).

Enterprises that verify scope of space of commercial area regularly can do: i) Change of the border at competitor's business foundation, ii) Discovery of change of scope of commercial area at change of consumer's characteristics and place that can be a strategic tool.

Make use of scope in commercial area from theory development: i) Verify stability of scope of the space at time elapse, ii) make use of the findings to research special system of overlap in commercial area.

4. Summary

This study described commercial area analysis theory of traditional market to be mathematical commercial area estimation method and model. Change factors included in the formula are no more than a part of many factors in commercial area. Further studies are needed to investigate each part and variables having influence upon commercial area.

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