

# Modular Store Design and Firm Performance

Dae-Yong Ahn\*

---

Modern stores are becoming increasingly modular in design. One example of the modular store design is a Wal-Mart Supercenter, which is a discount store-supermarket combination unit. The success of store chains can hinge on finding a “right” combination of store modules: While Wal-Mart has been able to expand its store base using Supercenters, K-Mart’s new format “Big K-Mart” has not fared well. Despite the growing importance of modular store design and its effect on firm performance, the extant literature does not provide any guidance to store managers on which store modules to adopt in order to improve store revenue. In this paper I study the effects of different store modules on firm performance. Specially, I estimate the effects of banks, ATMs, pharmacies and gas stations on weekly sales volume of grocery stores of the two largest supermarket chains in the state of Georgia. The results show that store characteristics account for the majority of variation in weekly sales volume of stores, whereas local business conditions? notably demographics and competition measures?do not possess much explanatory power. One thousand square feet of store size is equivalent to about five thousand dollars in weekly sales volume, about forty percent of store revenue on average. Adding a pharmacy leads to an increase of one hundred twenty thousand dollars in weekly store sales, a gas station eighty four thousand dollars and a bank sixty eight thousand dollars. The results illustrate the importance of choosing right modules in store design on firm performance.

Keywords: Store Modules; Store Revenue; Store Design; Retail Strategy

---

## I. Introduction

Many modern retail stores can be seen as a collection of modules, each of which contains a retail department within; for example, a Wal-Mart Supercenter can be seen as a combination of a general merchandise

store and a full grocery store. Choosing a “right” combination can prove to be very profitable; Wal-Mart has been able to expand its store base nationwide by opening nearly one hundred Supercenters every year since 1990, while its one-time rival K-Mart has seen its fortunes decline to the point of entering

---

\* College of Business and Economics, Chung-Ang University (daeyongahn@cau.ac.kr)

Chapter 11 bankruptcy in 2002 when its new store format Big K-Mart — which added home fashions and children’s apparel to general merchandise — did not fare as well.

Why is a certain combination more profitable than others? In this paper, I estimate the effects of different modules, such as pharmacies, banks and other specialty departments(i.e., beer or wine section), on the revenues of grocery stores in United States. This problem is highly relevant to store managers, because they incur high costs of adding new modules and also face difficulties in downsizing existing store modules(for example, due to the contractual agreement between the store and a bank). While some modules contribute substantially to the store revenues, others do so only minimally. So identifying the modules with high revenue potential is of utmost importance.

In estimating the effects of store modules, it is necessary to incorporate other factors that affect firm performance. Based on the findings of earlier papers, the regression includes the variables that affect store sales on a local level, including location and demographic characteristics, the measures of competition(both the same chain’s and competing chain’s stores), store characteristics (such as store size), and any geographic pattern that affects retail sales.(Section 3.2 discusses the relevant literature.) The control variables also include if the store is an early

entrant or not. The model is a variation of spatial interaction models that are still widely used in practice.

The research questions pertinent to this paper are, for example: How much of weekly sales volume of a store its size is responsible for? Which modules contained in the grocery stores in the data namely, banks, ATMs, pharmacies and gas stations — have the biggest impact on store revenues? Is it better to host a pharmacy or a bank in the store(or a gas station)? Which one boosts the sales of the store most? The answers to these questions allow a store manager to design his(or her) store to maximize its profit potential.

The rest of this paper is organized as follows: The next section reviews the literature on store sales forecasting methods, followed by data description, the formulation of the regression equation, and the discussion of the main results. Then the paper concludes.

## 2. Literature review

The extant literature on sales forecasting of stores can be classified into three categories: subjective approaches, normative approaches, and statistical models. Subjective approaches rely upon the subjective judgment of an analyst to forecast the sales of stores. The analog procedure is representative of

subjective approaches (Applebaum 1966). This procedure uses a survey technique, called customer spotting, to identify the travel patterns of customers. Store patrons are plotted on a map at their origins to demarcate the trade area of a store. The sales of a store are then estimated based on the travel patterns of its customers and the size of population residing in its trade area. This procedure creates a set of analogs that an analyst can select from to infer the market penetration level of a new store at a different site. Other subjective approaches incorporate managerial judgments to forecast the sales of stores (Rogers and Green 1978; Durvasula et al. 1992). Subjective approaches suffer from the over-reliance on the ability of an individual to accurately identify the underlying mechanism that determines the sales of stores.

Normative approaches impose a priori assumptions in sales forecasting of stores. For example, gravity models assume that the patronage of a store is inversely proportional to distance and proportional to store size (Huff 1964). A breaking point of patronage between two stores is calculated from a mathematical formula based on these normative assumptions. By connecting the breaking points around a store, the trade area of the store is delineated and its sales are estimated. Many authors extended gravity models by adding

more normative assumptions, such as a retailer image factor (Stanley and Sewall 1976). Normative approaches possess a major flaw in that the estimates they provide for the sales of a store are with unknown accuracy. In addition, these approaches are more popular in Europe than in North America due to the higher level of car ownership in America that diminishes the importance of distance in store choice (Rogers 1984).

Spatial interaction models and multivariate regression models provide empirical bases for statistical inference of sales forecasting of stores. Spatial interaction models are the generalization of gravity models with statistical assumptions (Nakanishi and Cooper 1974; Weisbrod et al. 1984).<sup>1)</sup> These models still rely upon distance as a major determinant of the sales of a store, but also use more constructs from consumer behavior than gravity models do. Multivariate regression models, on the other hand, allow the full considerations of customer, store, and competitor characteristics in a single framework. Liu (1970) uses stepwise regression to identify both micro-level (customer, store characteristics) and macro-level (government policies) variables that affect the sales of stores in large metropolitan areas. Ingene (1984) also uses a multivariate regression

---

1) Spatial interaction models are also called multiplicative competitive interaction models.

analysis to determine structural factors that influence market potential for firms.

The model used in this paper is a version of spatial interaction model adapted to incorporate the modular nature of modern store designs. I detail the data and the variables used in estimation in the next section.

### 3. Data

#### 3.1. Data sources

The data come from two sources: The revenues and locations of grocery stores are obtained from the commercial vendor, Trade Dimensions, Inc., a subsidiary of ACNielsen. This data set provides the average weekly sales of grocery stores of two major supermarket chains in the state of Georgia in the fiscal year of 2006.<sup>2)</sup> Together the two chains hold the majority of grocery sales in the state. There are a total of one hundred ninety four stores in the data. Store locations are recorded in the form of geographic coordinates(i.e., latitudes and longitudes) as well as Federal Information Processing Standard (FIPS). The data set provides information on the size of stores(in square feet) and the

modules in each store, such as banks, Automatic Teller Machines(ATMs), pharmacies, and gas stations, and it also records the opening date for each store. The data for demographics surrounding the locations are collected from the U.S. Census Bureau's web site. The unit of locations is a census tract, which is a small and relatively homogenous area with respect to demographics.<sup>3)</sup>

#### 3.2. Variable Selection

In this section, I specify the set of variables that are used to explain the variation in store performance(i.e., store revenue). The selection of variables included in the analysis is based on the findings of the previous literature.

First, I include demographics in the area surrounding a store to account for the variation in store revenue. Waldfogel(2010) found that demographics such as age, education, race and income influence which types of retail establishments enter the neighborhood, so I use the log of population(LOGPOP), population density (POPDEN), the proportions of whites, blacks and Hispanics(WHITE, BLACK, HISPANIC), the proportion of male population(MALE), the average household size(AVGHHSZ), and

2) One of the two supermarket chains has national presence in the United States, and the other has substantial market share in the Southern states.

3) [https://www.census.gov/geo/reference/gtc/gtc\\_ct.html](https://www.census.gov/geo/reference/gtc/gtc_ct.html)

median age of the population(MEDAGE) to control for demographics of the sample locations. Furthermore, I include the vacancy rate of local housing(VACANT) to proxy for the economic situation of each location, which can include the poverty and income levels of the neighborhood.

Second, I include the characteristics of the store to account for the variation in store revenue. Store characteristics also affect store revenues. Store size(SQFTTOT) is expected to have a positive relationship with store revenue. I also include the number of years the store has operated(INCUMBENCY) to represent any “early mover advantages” that might be present. Carpenter and Nakamoto(1989) shows that the pioneering advantage is present even in a situation where switching costs are minimal. A similar scenario may apply to the context of store choice, if the first-mover in the market position itself to satisfy the needs of local consumers.

Third, I include the indicators for the presence(or absence) of store modules to account for the variation in store revenue. Store modules(their presence), such as a bank(BANK), an Automatic Teller Machine (ATM), a pharmacy(PHARM), and a gas station(GAS), are included in the regression.

Fourth, as in other spatial interaction

models, I incorporate the measures for local competition in the regression. Following Clifton et al.(2013) who found that retail establishments within three to five radius from each other are likely to compete directly — and noting that the data include stores from two major chains in the sample locations — I include the following four variables as competition measures:<sup>4)</sup> the number of stores of the same chain within three miles of radius from a store (SCOMPOWN3), the number of stores of the same chain between three to five miles of radii from a store(SCOMPOWN5), the number of stores of the competing chain within three miles of radius from a store (SCOMPOTHER3), and the number of stores of the competing chain between three to five miles of radii from a store(SCOMPOTHER5).

Finally, as a part of local business conditions, I also include two other variables: the latitude of the store location(SLAT) and the longitude of the store location(SLONG). These variables are include to reflect any pattern of unobserved factors in the geography of the chosen area(i.e., the state of Georgia). For example, there can be some geographic trend as we move from the Southern part of Georgia to the Northern part. By including SLAT and SLONG, we are essentially account for a spatially non-

---

<sup>4)</sup> See a similar treatment of competition effects in Watson(2009).

stationary data-generating process. Note also that including the geographic coordinates (i.e., the latitude and longitude of locations) in a spatial analysis is akin to including the “period” variable in a time-series analysis, and it is widely used. This is a commonly used technique in geography and called detrending. Readers are referred to Chun and Griffith(2013) for more details on this technique.

### 3.3. Descriptive statistics

Table 1 shows the summary statistics for the sample of stores. The average weekly sales volume is about a half million dollars, and the stores are about forty five thousand feet wide on average. Some stores were just built and others have stayed in the market for close to forty years. About eighty two percent of stores have ATMs and fifty eight

percent of them banks. Only about twenty one percent of the stores have attached gas stations, but the majority of them have pharmacies within.<sup>5)</sup>(Here these pharmacies are owned by the store.) But there still is a significant degree of variation in store characteristics across stores, as seen in the relatively large standard deviations. Since there are a total of one hundred and ninety four stores in the data, the number of ATMs, banks, gas stations, and pharmacies are 159, 113, 40, and 184, respectively.

Table 2 shows the summary statistics for demographic variables in the sample of locations. Overall, the sample locations are quite heterogeneous in their characteristics: some locations are almost entirely racially homogenous(either close to 100% white or black), while others have a racially mixed composition. The vacancy rate ranges from

〈Table 1〉 Summary statistics for the sample of stores

Variable	Definition	Mean	Std. Dev.	Min.	Max.
WKTOTVOL	Weekly store sales in 1000's of dollars	491.75	177.90	100	1050
SQFTTOT	Store size in 1000's of square feet	45.03	8.36	12	68
INCUMBENCY	The number of years since the store opened	13.64	7.97	1	37
ATM	Whether the store has an ATM(=1 if yes, 0 otherwise)	0.82	0.39	0	1
BANK	Whether the store has a bank(=1 if yes, 0 otherwise)	0.58	0.49	0	1
GAS	Whether the store has a gas station(=1 if yes, 0 otherwise)	0.21	0.41	0	1
PHARM	Whether the store has a pharmacy(=1 if yes, 0 otherwise)	0.95	0.22	0	1

5) Since about 95% of stores have a pharmacy, it is possible that there may be some systematic differences between the stores with pharmacies and those without.

(Table 2) Summary statistics for demographic variables in the sample of locations

Variable	Definition	Mean	Std. Dev.	Min.	Max.
LOGPOP	Log of population in 1000's of persons	1,93	0,51	0,20	3,30
POPDEN	1000's of persons in 100's of square miles	1,81	1,72	0,03	12,26
WHITE	Proportion of white population	0,68	0,26	0,01	0,98
BLACK	Proportion of black population	0,25	0,26	0,00	0,98
HISPANIC	Proportion of Hispanic population	0,05	0,06	0,00	0,42
MALE	Proportion of male population	0,49	0,03	0,41	0,61
MEDAGE	Median age of the population(in ten years)	3,40	0,39	2,17	4,73
AVGHHSZ	Average household size	2,62	0,37	1,53	3,42
VACANT	Vacancy rate	0,06	0,04	0,01	0,38

(Table 3) Summary statistics for competition measures in the sample of locations

Variable	Mean	Std. Dev.	Min.	Max.
SCOMPOWN3	0,69	0,96	0	4
SCOMPOWN5	2,26	2,10	0	8
SCOMPOTHER3	0,10	0,10	0	1
SCOMPOTHER5	0,02	0,18	0	2

one percent to thirty eight percent, indicating that there are some well-to-do locations and some very run-down neighborhoods. Median age of the population also ranges from twenty two years old to forty seven years old. Perhaps the most important indicator of market size, LOGPOP, also has a quite large range. The variation in these variables helps us identify which factors are crucial in determining the revenues of stores.

Table 3 shows the summary statistics for the competition measures used in the sample of locations. On average there are more stores of the same chain within five miles of a store (about three stores) than those of the competing chain (less than one). This can be explained as follows: Supermarket chains tend to cluster their

stores in one region of the market preemptively rather than placing them next to the stores of the competing chain. This type of store-location strategies result in dividing up the market by competing chains such that they avoid direct competition and instead enjoy a sort of spatial monopoly.

## 4. Estimation results

### 4.1 The Functional Relationship between Dependent and Independent Variables

The purpose of this paper is to understand the relationship between the modules within a store and its revenue, thereby shedding light on this far neglected issue of which

modules to include in the store to enhance firm performance.

As a proxy for the performance of a store, I use the weekly sales volume of the store denoted by WKTOTVOL. This is the dependent variable of the regression. As independent variables, I include a set of store characteristics — including the presence or absence of modules — as well as local business represented by the set of local demographics.

The functional relationship between the dependent and independent variables takes a simple linear form where

$$\text{WKTOTVOL} = f(\text{Store characteristics, Local business conditions, Competition measures}).^{6)}$$

Here store characteristics include SQFTTOT, INCUMBENCY, ATM, BANK, GAS and PHARM; local business conditions include LOGPOP, POPDEN, WHITE, BLACK, HISPANIC, MALE, MEDAGE, AVGHHSZ and VACANT; and competition measures include SCOMPOWN3, SCOMPOWN5, SCOMPOTHER3, and SCOMPOTHER5.

I end up excluding BLACK and HISPANIC from the regression, because including them with WHITE makes those variables collinear; instead I include WHITE and WHITE2,

where the latter is the squared term of the former. Together these two variables indicate the degree of racial homogeneity in the area near a store.

## 4.2 Main results of this paper

Table 4 shows the results of the regression above. The adjusted R-squared is 0.38, so the independent variables as a group explain about thirty eight percent of the variation in the dependent variable, WKTOTVOL. For empirical analysis, this number is on a relatively high side. Below I discuss the results for the three groups of independent variables in turn: store characteristics, local business conditions, and competition measures.

### 4.2.1. Store characteristics (including modules)

Store size has a positive and significant effect on store revenue. An increase in one thousand square feet in store size leads to an increase of about five thousand dollars in weekly sales. On average, store size is accountable for about forty percent of store revenue. The estimated coefficient of INCUMBENCY is not statistically significant, and its sign is even negative: The longer the store stayed in the area, the less profitable it

6) Taking log transformation of WKTOTVOL does not change the results qualitatively. To ease the interpretation of the estimated coefficients, WKTOTVOL is used instead.



(Table 4) Effects of store characteristics, local business conditions and competition measures on store revenue

Variable	Coefficient	Standard error	p-value
----------	-------------	----------------	---------

(a) Store characteristics

SQFTTOT	4,769	1,557	0,003
INCUMBENCY	-1,749	1,664	0,295
ATM	36,120	33,866	0,288
BANK	68,421	25,528	0,008
GAS	83,953	28,875	0,004
PHARM	118,453	54,222	0,030

(b) Local business conditions

LOGPOP	11,445	26,483	0,666
POPDEN	-5,001	9,699	0,607
WHITE	-388,223	204,282	0,059
WHITE2	236,545	188,781	0,212
MALE	381,505	504,482	0,451
MEDAGE	4,601	34,991	0,895
AVGHHSZ	-135,911	42,836	0,002
VACANT	-65,156	325,011	0,841
SLAT	85,699	19,155	0,000
SLONG	26,588	13,756	0,055

(c) Competition measures

SCOMPOWN3	-12,715	14,013	0,366
SCOMPOWN5	-6,570	6,866	0,340
SCOMPOTHER3	-21,974	105,731	0,836
SCOMPOTHER5	-0,682	59,516	0,991

is. Hence the first-mover advantages are clearly not present in this case.

The main interest of this paper lies in the effects of store modules (i.e., banks, ATMs, pharmacies and gas stations) on store revenue. All but one of these variables have statistically significant and positive coefficients: Having a pharmacy seems to be most crucial — which translates into about one hundred

and eighteen thousand dollars more in weekly sales — followed by having a gas station — which results in additional eighty three thousand dollars in weekly sales — and finally having a bank in the store with roughly sixty eight thousand dollars worth of weekly sales.

Note that WKTOTVOL includes the sales from the pharmacy. But the additional revenue from the pharmacy is probably due to the combination of prescription and over-the-counter drug sales as well as an increase in grocery sales due to higher customer traffic (who came to the store specifically for drugs but also bought some groceries on the way). Gas purchases are likely to be non-planned in advance; they are convenience-oriented purchases. The extra weekly sales from having a bank are smallest but purely indirect demand. It shows that even if the store is not directly involved in banking, it still benefits from having the bank in its premise due to increase in customer traffic. The pharmacy has the biggest effect and the bank the smallest; this indicates that having additional products might lead to a larger increase in sales than having an extra service does. Note also that the pharmacy has the larger effect on sales than the gas station; this is probably due to the fact that the pharmacy — which is located within the store and is more of a shopping good — is more complementary

than the gas station — which is located outside the store and is more of a convenience good.

Overall, the results indicate that store managers should consider different combinations of store modules — both their benefits and costs — in order to maximize store revenues and profits. Some combinations might have more synergistic effects, as demonstrated in the success story of Wal-Mart's Supercenters.

#### 4.2.2. Local business conditions

Few of the demographic variables turn out to be statistically significant: WHITE and AVGHHSZ. Both of these variables have negative effects on store revenue. The negative sign on the coefficient of WHITE can be interpreted that racially homogeneous areas (with white population being the majority) are not profitable for grocery stores. Or it could mean that rural areas — which tend to have overly white population — do not produce as much grocery sales as urban areas.

Both SLAT and SLONG are statistically significant. This finding is important: It suggests that the data-generating process is spatially non-stationary. In other words, there might be some unobserved demand factors for groceries present across the sample locations. For example, there can be geographic features that make travel difficult for certain parts of Georgia or there might be

some demographic variables relevant for grocery sales that are missing in the data. SLAT and SLONG successfully capture these unobserved factors. Note that this result does not suggest that one can move a store to the upper left part of the map to increase the sales. Rather it merely reflects the fact that the city of Atlanta is located in the Northwest part of Georgia and that the explanatory variables included in the regression are not sufficient to account for this fact.

#### 4.2.3. Competition measures

Overall, the competition measures are not statistically significant. It seems surprising that the competition measures are not statistically significant. But there might be intuitive reasoning behind this result. When stores are competing for their locations (i.e., entry) competition plays an important role: The entry of competing stores at a particular location works as deterrent for a store to enter that particular location; however, once the store is in the market, the presence of competing stores nearby does not necessarily affect its revenue to a significant degree. This can be seen in the magnitudes of coefficients of competition measures: another store of the competing chain within three miles only drops the revenue of the store by about twenty two thousand dollars on average (less than five percent of the total sales volume).

4.2.4. Comparison with the regression results without store modules as explanatory variables

Table 5 shows the results of the regression without store modules as independent variables. The adjusted R-squared is 0,31, so the independent variables as a group explain about thirty one percent of the variation in the

(Table 5) Effects of store characteristics, local business conditions and competition measures on store revenue when store modules are excluded from the set of independent variables

Variable	Coefficient	Standard error	p-value
----------	-------------	----------------	---------

(a) Store characteristics

SQFTTOT	7,495	1,473	0,000
INCUMBENCY	-0,958	1,559	0,539

(b) Local business conditions

LOGPOP	23,837	27,286	0,384
POPDEN	-1,345	10,111	0,894
WHITE	-336,201	212,453	0,115
WHITE2	186,470	196,122	0,343
MALE	449,063	526,209	0,395
MEDAGE	2,254	36,245	0,950
AVGHHSZ	-113,789	44,420	0,011
VACANT	-145,133	340,804	0,671
SLAT	114,549	17,779	0,000
SLONG	34,893	13,904	0,013

(c) Competition measures

SCOMPOWN3	-19,236	14,573	0,152
SCOMPOWN5	-10,205	7,090	0,340
SCOMPOTHER3	-97,690	109,780	0,375
SCOMPOTHER5	18,993	62,334	0,761

dependent variable, WKTOTVOL. Comparing this number with the earlier one, we can see that store modules account for about extra eighteen percent of the variation in WKTOTVOL (=0,07/0,38). So the store modules as a group improves the model fit quite a bit.

Note that even without store modules, the other results for store characteristics, local business conditions, and competition measures remain relatively stable. Hence the results are robust to model specifications, and we can see that the estimated effects of store modules are not artificial results but real.

## 5. Conclusion

In the modern retailing landscape, more and more firms are re-designing their stores by adding modules to boost store revenues. The process seems somewhat ad hoc, as evidenced by some store designs succeeding (e.g., Wal-Mart Supercenters) and others failing (Big K-Marts). In this paper I have studied the effects of different modules on firm performance. Using data on store characteristics and revenues of grocery stores in Georgia, I estimated the effects of banks, ATMs, pharmacies and gas stations on weekly sales volume of grocery stores of the two largest supermarket chains. The results show that it is store characteristics — store size and store modules — that mostly

drive firm performance. But local business conditions, such as demographics of shoppers, do not play a major role in determining store revenues nor do competition measures between stores of the same and competing chains. For example, having a pharmacy in the store boosts the weekly sales of the store by one hundred and twenty thousand dollars; having a gas station or a bank on its premise increases the weekly sales of the store by eighty four or sixty eight thousand dollars. These findings suggest that choosing right store modules have a profound effect on store revenues. This paper takes a step towards formulating a profitable, modular store designs.

This paper, like other studies, suffers from a few limitations: First, it would be difficult to generalize the findings to retail stores other than grocery stores. Further investigation is warranted as to which combinations of store modules would be profitable across a wide range of retail formats. Since the data come from the state of Georgia, so it might be difficult to extrapolate the results to other parts of U.S. or the world. Second, and perhaps more importantly, the analysis was done using aggregate data (over consumers who generate store sales.) More detailed analysis would be desirable in order to decipher why consumers visit stores of different designs and/or how they shop across different modules of the same store.

For example, does adding a pharmacy to a store affect consumer purchases at other departments(if so, how)? These questions will only be answered using more disaggregate data. The pursuit of their answers is left for future research.

---

논문접수일: 2014년 9월 30일

1차수정본접수일: 2014년 10월 19일

2차수정본접수일: 2014년 12월 28일

게재확정일: 2014년 12월 30일

---

## References

- Applebaum, William(1966), "Methods for determining store trade areas, market penetration, and potential sales," *Journal of Marketing Research*, 3, 127-141.
- Carpenter, Gregory and Kent Nakamoto(1989), "Consumer preference formation and pioneering advantage.," *Journal of Marketing Research*, 26(3), 285-298.
- Chun, Yongwan and Daniel A. Griffith (2013), *Spatial statistics and geostatistics: Theory and applications for geographic information science and technology*, Thousand Oaks, CA: SAGE.

- Clifton, Kelly J., Christopher Muhs, Sara Morrissey, Tom'as Morrissey, Kristina Currans, and Chloe Ritter(2013), "Examining consumer behavior and travel choices," mimeo, Portland State University.
- Durvasula, Srinivas, Subhash Sharma, and J. Craig Andrews(1992), "STORELOC: A retail store location model based on managerial judgments," *Journal of Retailing*, 68(4), 420-444.
- Huff, David L.(1964), "Defining and estimating a trading area," *Journal of Marketing*, 28(3), 34-38.
- Ingene, Charles A.(1984), "Structural determinants of market potential," *Journal of Retailing*, 60(1), 37-64.
- Liu, Ben-Chieh(1970), "Determinants of retail sales in large metropolitan areas, 1954 and 1963," *Journal of the American Statistical Association*, 65(332), 1460-1473.
- Nakanishi, Masao and Lee G. Cooper(1974), "Parameter estimation for a multiplicative competitive interaction model- Least squares approach," *Journal of Marketing Research*, 9, 303-311.
- Rogers, David S.(1984), *Modern methods of sales forecasting*. In: Davies, R.L., Rogers, D.S.(Eds.), *Store Location and Store Assessment Research*, Wiley, Chichester, UK, 319-331.
- Rogers, David S. and Howard L. Green (1978), "A new perspective on forecasting store sales: Applying statistical models and techniques in the analog approach," *Geographical Review*, 69(4), 449-458.
- Waldfogel, Joel(2010), "Who benefits whom in the neighborhood? Demographics and retail product geography," *Agglomeration Economics*, edited by Edward L. Glaeser, 181-209.
- Watson, Randal(2009), "Product variety and competition in the retail market for eyeglasses," *The Journal of Industrial Economics*, 57(2), 217-251.
- Weisbrod, Glen E., Robert J. Parcells, and Clifford Kern(1984), "A disaggregate model for predicting shopping area market attraction," *Journal of Retailing*, 60(1), 65-83.

## 소매점 모줄화 디자인과 판매

안대용\*

### ABSTRACT

최근들어 소매점의 디자인은 점차로 모줄화되는 추세이다. 그 일례로 월마트 슈퍼센터는 디스카운트 스토어와 식품점의 결합이다. 소매점의 성공여부는 스토어 모줄의 적절한 배합을 찾는다 해도 과언이 아니다. 슈퍼센터의 개발로 월마트가 근 이십여년간 점포를 확장한데에 반하여, 경쟁자였던 케이마트는 빅 케이마트의 실패로 인해 쇠락하였다. 이러한 상점 모줄화의 중요성에도 불구하고 기존의 연구들은 스토어 매니저에게 어떠한 모줄의 조합이 상점의 판매에 공의 영향을 미치는 지에 대해 명확한 제시를 해주고 있지 못하다. 본 논문은 다양한 모줄들이 상점의 판매에 어떠한 영향을 미치는 지 실증적으로 검증한다. 구체적으로 본 논문의 식품점이 은행, 현금인출기, 약국 혹은 주유소를 유치하였을 때 주별 판매량에 어떠한 영향을 미치는 지 미국 조지아주의 가장 큰 두개의 슈퍼마켓 체인점의 데이터를 가지고 측정하였다. 연구결과를 살펴보자면 식품점의 주별 판매량의 대부분은 바로 그 식품점의 특성들에 의해 결정되는 반면, 식품점 주위의 경제적 환경 — 특히 인구통계적 요소들과 경쟁적 요소들 — 은 거의 영향을 미치지 않는다. 예를 들어, 천제곱피트의 상점크기는 주별 오천불 정도의 판매량과 동일한 데, 점포의 크기는 상점매출액의 사십퍼센트정도를 설명한다. 또한 식품점에 약국을 설치하면 주별 십이만불의 판매량을, 주유소를 설치하면 팔만사천불을, 그리고 은행을 설치하면 육만팔천불 정도의 매출을 증가할 수 있다. 이러한 결과들은 적절한 모줄의 선택을 통한 디자인이 점포의 판매에 미치는 중요성을 잘 보여주고 있다.

키워드: 소매점 모줄, 소매점 매출, 소매점 디자인, 소매전략

\* 중앙대학교 경영경제계열 경영학부 (daeyongahn@cau.ac.kr)