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A Study on the Prevention of Appropriate Store and Gentrification to Restore the Function of the Commercial District in the Original City*

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Abstract

Purpose: We would like to identify the appropriate size of stores in the commercial district suitable for the era of low growth. In addition, it is intended to present alternatives to prevent gentrification along with measures to revitalize commercial districts according to the selection of appropriate stores. **Research design, data and methodology:** The importance and commercial district usage patterns were identified through surveys by consumers and sellers. the demand and size of the commercial area were calculated based on the floating population and resident registration population. In addition, based on this, through metric analysis, the importance of the business district activation plan and what important matters can prevent gentrification were analyzed. **Result:** In this the study, 555 stores are currently operating in the target area, but it is seen as a commercial district with a scale that can operate 136 stores and 938 stores. In addition, it was analyzed that the Commercial Lease Protection Act needs to be strengthened to prevent gentrification. **Conclusions:** Due to the nature of small and medium-sized cities in Korea, commercial districts that have once lost their resilience must take much effort to find vitality. It is believed that local commercial districts will have resilience when diagnosis and recovery measures are adequately presented.

Keywords : Business District, Empty Store, Original City Center, Demand Forecasting Model, Gentrification

JEL Classification Code : C53, L8, L85, R12, R38.

1. Introduction

1.1. Background and Purpose of the Study

As modern cities went through industrialization, internal and external changes in cities progressed rapidly. These changes not only have become a major factor in improving competitiveness inside and outside the city, but also show a phenomenon in which pain from growth spreads and spreads. A typical example is a commercial area located in the original city center, which played an important role in communication and economic activities in the past, and was also used as a major basis for judging the competitiveness of the city. However, the growth and change of cities began to enter the path of decline in the existing city center, and this phenomenon began to occur not only in Korea but also in advanced countries such as the United States, the United Kingdom, and Japan. In order to overcome this phenomenon, developed countries have prepared various policies to revitalize the central city commercial district, and Korea has attempted policies that can revitalize the central city since the early 2000s.

Currently, one of the biggest problems in Korea is that the number of consumers and economically active people is also decreasing due to a decrease in population, and the number of factors that directly perform consumption within the commercial district is decreasing, forcing the commercial district itself to be reduced. Of course, large

* This study reconstructed a study conducted by SEMAS to revitalize the commercial district.

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commercial districts in the region or major commercial districts in the country will not apply, but the original downtown commercial districts in the region will be hit hard. The original downtown commercial district that has been created now is a commercial district that has grown in the process of urbanization and industrialization in Korea. It was expanded in line with the purchasing power of the consumer group and the period of rapid growth. Since it is a commercial district that has been gradually expanded from the stage due to the diversification of the commercial district due to housing site development, it can be said that it has a lot of difference from the current era of low growth. However, despite understanding these differences and circumstances, a large amount of budget is being invested to revitalize the existing shopping malls, but side effects are starting to appear rather than effectiveness. In addition, the central government department is investing a large amount of budget at once to improve empty stores, raising the issue of overlapping investment. The reason why empty stores in the commercial district have begun to occur is that it can be raised in various ways, but on the surface, supply and demand are not appropriate. This can be said to be a side effect because it causes a wider gap in supply and demand due to overcrowding between the economically active population (consumer) and sellers in the region, and the overcrowding of collective shopping malls. In this situation, if shopping malls are properly located and operated, these problems will be reduced, and sustainable conditions will be provided for the local commercial ecosystem.

On the other hand, although policies and efforts suitable for the low growth era must be expressed for the functional recovery of commercial districts, only one-dimensional budget input has been continuously carried out for several years rather than solving the fundamental problem. There are also places where the cation phenomenon occurs. Therefore, in this study, there may be methods and efforts to restore the function of the declining original downtown commercial district, but among them, the appropriate size of stores in the commercial district is identified to determine the size of each business district suitable for the era of low growth. In addition, I would like to propose an alternative to prevent gentrification along with a plan to revitalize commercial districts according to the selection of appropriate stores. The study target area is a small and medium-sized commercial area in the region, and it is intended to target the Gunsan public commercial area in Gunsan-si, Jeollabuk-do. Gunsan, the subject area of study, is a space where various policy projects of the central government are combined and the characteristics of the downtown area are well revealed. It is a place where changes from declining areas to vital areas are expected to occur in the future, so it is to provide the following three purposes through this study in the situation where many national budgets are being invested. First, it is to provide basic data on local government's commercial district policy by providing an appropriate store size for restoring the function of the original downtown commercial district. In a situation where demand and supply are not smooth, the emptier stores there are, the less competitive the city is, and it is necessary to come up with measures to improve and overcome them. Second, it is necessary to identify the appropriate size of stores in the region and provide policy management, efforts to prevent gentrification, and customized policies for each region so that stable commercial districts can be maintained. Accordingly, it is to provide a policy alternative to prevent gentrification within the commercial area. Finally, it provides more realistic analysis data and information through empirical research in restoring the functionality of coastal local city commercial districts in situations where the degree of occurrence of vacant stores varies depending on the characteristics of new cities, metropolitan cities, and local cities.

1.2. Scope and Method of Research

The study target area is Gunsan-si, Jeollabuk-do, located in the northwest of Jeollabuk-do, and is the only port city that functions properly in Jeollabuk-do. As the port was adjacent, it was the center of the shipbuilding and automobile industries, but the local economy was hit hard in 2017 when the shipyard was shut down and the automobile industry was withdrawn. As a result, the local commercial district began to stagnate, and in order to solve this problem, the Gunsan Public Commercial District, which used to be the central commercial district of Gunsan City, was used as the subject of empirical research. On the other hand, In this study, first of all, we tried to understand the trend of research through literature study, and through this, we looked into various research methods to improve the direction and quality of the study. Next, a framework for empirical research was created while analyzing the current status of the research area. Next, the importance and usage patterns of commercial areas were identified through the questionnaires of consumers and sellers. Based on this, based on GIS-based current status data, we tried to determine the demand and scale of commercial districts by examining the declining commercial district, which is the representative commercial district of the region, and calculating the appropriate store size for functional recovery based on the floating population and resident registration population. In addition, the scale of reduction or reduction by industry was quantitatively presented through classification by industry. Based on this, we will analyze the perceptions of commercial districts through importance of ways to revitalize commercial districts and prevent gentrification for customers and store owners through

matrix analysis similar to IPA (Intelligent Process Automation) analysis. This analysis method used an analysis method expressed in coordinates on a two-dimensional plane with X and Y axes, respectively.

In order to understand the most necessary requirements for solving the gentrification problem, a survey was conducted and analyzed by dividing it into multiple opinions and core opinions.

Through this result analysis, shopping malls of appropriate size required to revitalize commercial districts in local research sites, and measures to prevent gentrification, which is an external side effect, were presented together.

1.3. Differentiation

This study basically provides quantitative data that could provide basic persons necessary for policy planning to revitalize local and central governments' commercial districts. In addition, to increase readability, the characteristics of commercial buildings and the current status of each industry were identified based on GIS. In addition, the appropriate size of the commercial district was identified through two factors, and an expected value for adjusting the size of the commercial district was presented. Based on these result values, the opinions of consumers and sellers were synthesized to derive the results using a matrix method for revitalizing commercial districts. Another study suggested a method of activation or gentrification prevention as one method. However, this study suggests a method of activation and a plan to prevent gentrification after activation based on an appropriate scale, which can be said to have a differentiation in the study. In addition, the appropriate shopping mall size was presented based only on the floating population in the current study. However, this study shows the second difference with newly included in the economically active population among the resident registered population.

2. Theoretical Considerations

2.1. Prior Research

2.1.1. A Study on Gentrification

Unlike advanced countries, where discussions have been actively conducted since 1960, Korean academia only appeared in the late 1980s, but it was insufficient. Since then, as it gradually expanded in the 2000s, many studies focusing on cases suddenly began to be conducted. What began to be known to the general public in Korea was first mentioned in the Korea Herald (February 25, 2004). The definition of gentrification is clearly defined, but there is a difference at home and abroad. In developed countries, it refers to the phenomenon that new commercial districts gradually replace existing regional bases or old commercial districts as depressed local commercial districts become luxurious or new commercial districts occur, and in Korea, existing commercial tenants leave or invest large amounts of capital. Due to the national and regional characteristics, research on gentrification has also been conducted in various ways as follows. The concept of gentrification, the discussion of supply and demand centered on Smith and Lee, and the debate between them were examined. In addition, topics such as new development gentrification were reviewed, and directions for future research were sought through critical reconsideration of the discussion on gentrification (Sin & Kim, 2014). Reconstructed the commercial gentrification sentiment index into 6 counterparts and 18 observation variables based on previous studies. In detail, the positive and negative importance between indicators was compared through the hierarchical analysis technique, and based on this, a plan to utilize the indicators was proposed (Yoo & Park, 2021), aimed to analyze the spatial distribution of owner change in Insa-dong, Jung-gu, Seoul, which is considered to be an area where commercial gentrification occurred. In particular, implications were drawn to understand the spatial pattern of owner change and to select buildings subject to local assetization and community assetization, which are being raised as policy alternatives to prevent commercial gentrification (Lee & Hong, 2020), aimed to identify the determinants of the amount of rights in the gentrification sites in major commercial areas in Seoul. Multiple regression analysis was used, using the right amount, monthly rent, and deposit for each store as dependent variables. The results of this study improved understanding of the determinants of entitlements in the areas where commercial gentrification occurred, and provided basic data for the development of a more sophisticated decision model in the future (Lee et al., 2020), performed a binary logistic regression analysis using SPSS based on the data. In the analysis, the collected data is classified into the metropolitan area and the non-metropolitan area to derive factors that are highly correlated with the gentrification origins, respectively, and the main focus is on deriving the occurrence factors for the gentrification origins in the two regions and performing comparative analysis between the regions. are leaving (Park et al., 2020). The location factors and change characteristics of residential areas where commercial gentrification occurred in Seoul were analyzed using the logit model. As a result of the analysis, it was found that residential areas where commercial gentrification occurs in Seoul occur in residential areas with a high total floor area ratio of detached houses and many neighborhood living facilities. Based on the location characteristics of the residential area where

commercial gentrification occurred in Seoul and the change in land use, policy implications for commercial gentrification in residential areas were presented (Lee et al., 2018). It aims to establish and utilize gentrification prevention standards on how to control and induce land use and building use changes by comprehensively analyzing the spatial structure characteristics and building use changes by store space in the street in Gunsan, Jeollabuk-do (Kim et al., 2021). As a result of analyzing regional factors and characteristics based on four important indicators of gentrification in urban regeneration projects (divided into four evaluation areas and composed of four factors, production, consumption, supply, and demand), it was analyzed that franchise increase and rent increase factors were large (Lee, 2019). Through empirical analysis, literature, and case analysis of five major representative streets in Busan, various causal relationships were identified through factor analysis, correlation analysis, and regression analysis on solutions to commercial rights disputes according to gentrification (Kim & Kang, 2019). As such, the commercial area in the original city center was a space that adultery the representation and vitality of the region in the past, but it began to decline as it lost its past appearance due to the spatial reorganization of the city center. Overcoming these environments and conditions caused internal and external shocks (central investment & general investment), which could bring vitality to the commercial area, but this is another problem in the commercial area, and research is being conducted to find differentiated and customized ways.

2.1.2. A Study on Revitalizing the Commercial District of the Original City

The downtown commercial area was one of the major indicators to measure the competitiveness of the city in the past, but recently, as the downtown commercial area has begun to decline, various studies on the activation of commercial areas are underway. 50 urban revitalization projects were analyzed using idle facilities in 14 local cities in Japan. As a result, as an urban regeneration strategy using idle facilities, the results were derived by combining other functions centered on commercial functions or introducing new functions necessary for urban centers (Song, 2018) proposed a revitalization plan for Seomun Market, the center of Daegu's original downtown commercial district, using the IPA technique on the perception of visitors to Seomun Market. The importance and satisfaction of factors to consider when visiting Seomun Market analyzed. Through this, suggestions for which factors should be put forward for revitalization of Seomun Market were suggested, and ways to revitalize Seomun Market were sought so that the vitality of Seomun Market could be spread to the original downtown business district and region (Cho & Ryu, 2019). Importance and satisfaction were calculated through the IPA technique by residents of Andong and visitors to the food street to revitalize the street, one of the Andong City urban regeneration project pillars. In order to enhance competitiveness in the future, implications for what factors are required were presented, and a way to vitalize the food street (Ryu & Kim, 2018).

Using the K-mean clustering method through the standardization process of variables to identify the possibility of reactivation in the Apgujeong Rodeo commercial area, the research diagnoses the possibility of reactivation from a long-term perspective. It diagnoses the phase of the commercial area change (Kang & Park, 2021), In order to evaluate the commercial district revitalization system (project) promoted by the government, experts' opinions were collected, and the results of the commercial district revitalization project were derived using AHP and PROME for the implications (Ryu & Choi, 2013).

2.1.3. A Study on the Estimation and Similarity of the Proper Size of Shopping Districts

Although there is a lot of interest in the lack of proper research on shopping malls, research began in early 2020 amid the lack of basic statistical data. However, studies such as scale calculation and premium calculation have been continuously conducted, and in recent years, the following studies have been conducted. The importance was confirmed by analyzing the effect of pedestrian traffic and attributes and characteristics of 96 major commercial districts in Korea on determining the proportion of monthly rent in shopping malls. Furthermore, the effect of interaction was quantitatively analyzed by correlating the proportion of monthly rent, the time zone, the age, and the amount of pedestrian traffic according to the day of the week (Jeong & Kim, 2014), basic study for establishing a Korean-style commercial district revitalization model as one of the methods and methods for the regeneration and management of the decaying original downtown commercial district. proposed new policy alternatives (Ryu, 2019). Among the areas where the commercial district declined, the appropriate size of the original downtown commercial district was identified through empirical research in Cheonan, Chungcheongnam-do and Jinju, Gyeongsangnam-do, which are carrying out projects by the central government (Ryu, 2021). Based on the data from the Korea Appraisal Board, cases and statistical data were used for the metropolitan area (Seoul, Incheon, Gyeonggi-do), and countermeasures for vacant shopping malls were presented through characteristic analysis of large-scale location cases (Nam et al., 2019). We estimated the expected share of new department stores in Ulsan city and predicted sales. The market range and market size of the whole region were calculated and the market share change of new department

stores and competitors was predicted through the Huff model (Chung, 2018). This study empirically analyzed the determinants of premium in consideration of the characteristics of commercial districts where stores are located and the characteristics of the surrounding areas in order to escape the unclear calculation of premium for Busan. As a result of the empirical analysis, it was found that conversion deposits, restaurants, floors of stores, and floating populations around shopping malls had a positive (+) effect on the premium, and households around shopping malls had a negative (-) effect on the premium (Suk et al., 2018).

3. Empirical Study

3.1. Current status and Characteristics of the Research Site

Looking at the distribution environment in Jeollabuk-do, 114 traditional markets are located. Among them, 18 traditional markets are located (15% proportion) in Gunsansi, and the sales area is 91,517 ㎡, 13% of Jeollabuk-do. The building area is 41,564 ㎡ of 5%. In the case of a large market in Gunsan, two are located within 1.3km to 2km from the commercial district of the study target area. Gunsan-si played a pivotal role in Jeollabuk-do's economy, but the local and alley economy were extensively damaged by the closure of multinational companies (GM 2018.5. Korea).

Source: own elaboration

Figure 1: Research Areas(Gunsan Public Market)

Table 1: Stores Distribution Environment in Gunsan City

	Total			Hypermarket		
	Subtotal			Subtotal		
Sortation	A	B	C	A	B	C
Jeollabuk-do	114	663,316	764,374	17	176,963	518,570
Gunsan	18	91,517	41,564	2	-	-
%	15.0	13.0	5.0	11.0	-	-

Note: A: Number of companies (units), B: msales area (㎡), C: total floor area of the building (㎡)
Data: Jeollabuk-do, 2019, "Basic Statistics of Jeollabuk-do"

The shipbuilding industry (Hyundai Heavy Industries Gunsan Shipyard, 2017.7) Gunsansi showed constant decrease with the economically active population each year. As of 2018, the population has decreased significantly compared to other local governments each year, which should be managed with interest. Gunsan Public Market consists of commercial district where Sinyeong market and Gunsan Permanent market are located aligned with the Gunsan-Suneui station in 1918. Markets are in the research target area. However, due to the aging of the market building, it was improved to a modern market building-type market in 2012. It was rebuilt as a building-type market in 2013 and has convenient facilities such as air conditioning and heating facilities, moving walks, elevators, infant rooms, parking lots, and women's education centers inside the traditional markets. Gunsan Public Market is the largest market in Gunsan-si and has been reborn as a general market selling vegetables, grains, livestock, local specialties, fruits, herbal medicines, and daily necessities.

Meanwhile, the Sinyeong market adjacent to Gunsan Public Market was re-established in the 1980s as a street vendor maintenance and shopping mall migration project in the parking lot area of the public market, and the direct sales items are seafood, fish and shellfish, and agricultural products. The Sinyeong Market has established a cooperative for the online shopping mall to distribute local specialties and develops and sells parcel products in public workplaces. Sinyeong Market consists of 181 stores and is maintained as a major neighborhood commercial market used by residents. In the Gunsan Public Commercial Area, the fishery industry ranks first due to geographical characteristics, and other retail and green life service industries are the mainstays.

The overall average store area of Gunsan commercial area was 35.7 ㎡, 58.4 ㎡ for other retail businesses, 49.9 or neighborhood living service, and 48.1 ㎡ for a restaurant business. As for the type of store ownership, 28.3% were owned by the owner, and 71% of the monthly rent (lease) was found to be high. In terms of gender, women account for 70.6% of store owners rather than men. Gunsan Public Commercial District surveyed Friday (42.3%), Thursday (24.3%), and Saturday (17.7%) as the largest daily sales day. Conversely, Monday (41.6%) and Sunday (39.2%) were

surveyed in order on days with low daily sales. In the Gunsan commercial district, when analyzing the time zone with the most customers during the week, it was surveyed in the order of 10 to 12 (28.3%), 8 to 10 (24.9%), and 12 to 15 (18.4%). The time zone with the largest number of weekend customers was also the most from 10 am. to noon. (28.0%), followed by 8 am. to 10 am. (20.1%) and 3 pm. to 6 pm. (16.4%). Gunsan Public Commercial District generally has a very high proportion of women customers at 87%, and men customers at 13%. By age group, 47.1% of people in their 50s visited the most, followed by 29% in their 60s or older, mainly used by middle-aged and older people. On weekends, people in their 50s also showed a 1.7% higher frequency of visits than on weekdays, while those in their 60s and older showed a 3.1% decrease.

3.2. Analysis of the Empirical Survey of the Research Target Site

A primary survey and questionnaire study were conducted to analyze the actual conditions of Gunsan public, commercial districts. The primary survey was conducted from October 29 to November 10, 2019, and the second survey was conducted from November 25 to 30, 2019. The questionnaire survey was conducted on all stores of 298 buildings within the survey target area, which is the Gunsan public, commercial area. The basic survey was conducted as an actual survey, and the survey was conducted as a 1:1 day interview survey. In order to understand the current status of empty stores, a direct total survey was conducted by comparing them with architectural drawings.

Table 2: Target Area Population and Vacant Stores

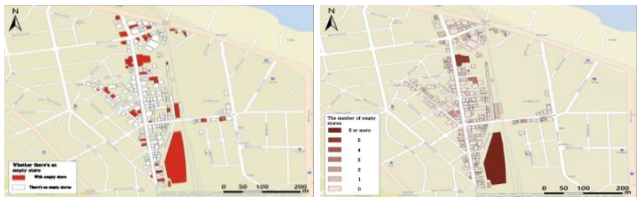
Sortation	Survey population	Number of Effective Responses	Empty store	Sales store
Gunsan Public Commercial District	682	564	127	437

There were 1,144 buildings identified through the primary survey, of which 682 buildings were conducted a one-on-one interview with all stores, and 462 buildings identified as non-survey buildings such as homes, general offices, and warehouses. Gunsan Public Commercial District has 127 empty stores out of 682 stores by industry which is 18.6% of the surveyed stores. Of the 298 buildings in the survey area, 38 were found to have one or more empty stores, 12.6%, and 16.8% were surveyed compared to 226 buildings that included one or more stores in operation of the total stores, a total of 555 are open, with 83 fisheries products, the largest at 15.0%, followed by neighborhood living services (79, 14.2%), processed foods (74, 13.3%), and other retail (72, 130.0%). Conversely, 17 livestock products (30.1%) and household goods (41 and 7.4%) were surveyed to be less. The total number of stores in operation is 555, and when looking at the distribution by floor, 447 stores (80.5%) were on the first floor, and 105 stores (18.9%) were on the second floor, mainly on the first and second floors.

Table 3: Percentage of Stores by Industry

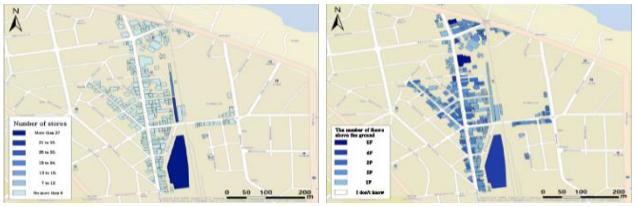
	A	B	C	D	E	F	G	H	I	Total
Number of stores(unit) **(%)**	83	79	74	72	66	65	58	41	18	555
	(15.0)	(14.2)	(13.3)	(13.0)	(11.9)	(11.7)	(10.5)	(7.4)	(3.1)	100.0

Note: A: Aquatic products, B: Neighborhood life service, C: Processed food, D: Other retail businesses, E: Clothing and Shoes, F: Restaurant business, G: Agricultural produce, H: Household items, I: Livestock products.



Source: own elaboration

Figure 4: Status of vacant stores in the study Site



Source: own elaboration

Figure 5: Percentage of stores by industry

There are 226 buildings distributed in the study target area. Of these, two buildings (0.8%) had more than five empty stores were surveyed. There were five buildings (2.2%) with two empty stores were surveyed, 30 (13.3%) with one empty store, and 188 (83.2%) buildings without empty stores were surveyed.

One building (0.4%) sells more than 600 products among the buildings.0 buildings sell 451to 600 kinds of products (0%).

Table 4: Status of Vacant Shopping Malls by Industry

		A	B	C	D	E	F	G	H	I	Total
1F	unit	83	48	74	69	21	60	58	17	17	447
	(%)	18.6	10.7	16.6	15.4	4.7	13.4	13.0	3.8	3.8	100.0
2F	unit	0	29	0	3	45	4	0	24	0	105
	(%)	0.0	27.6	0.0	2.9	42.9	3.8	0.0	22.9	0.0	100.0
3F	unit	0	1	0	0	0	1	0	0	0	2
	(%)	0.0	50.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	100.0
4F	unit	0	0	0	0	0	0	0	0	0	0
	(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5F	unit	0	1	0	0	0	0	0	0	0	1
	(%)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Total	unit	83	79	74	72	66	65	58	41	17	555
	(%)	15.0	14.2	13.3	13.0	11.9	11.7	10.5	7.4	3.1	100.0

Note: A: Aquatic products, B: Neighborhood life service, C: Processed food, D: Other retail businesses, E: Clothing and Shoes, F: Restaurant business, G: Agricultural produce, H: Household items, I: Livestock products

It was surveyed that (0.9%) sold 151 to 300 products, and 222 buildings (98.2%) sold less than 150 products. Among the stores in operation, one (0.2%) sells more than 61 products, six stores (1.1%) sell 41 to 60 products, three stores (0.5%) sell 31 to 40 products, 40 stores (7.2%) sell 16 to 30 products, and 505 stores (91.0%) sell less than 15 products. Of the 226 buildings, one building with 18 male owners (0.4%), one building with six male owners (0.4%), five buildings with two male owners (2.2%), and male owners 52 (23.0%) buildings with one owner and 167 (73.9%) buildings without a male owner were surveyed. Conversely, one building with 107 female owners (0.4%) and one building with 26 female owners (0.4%), one building with nine female owners (0.4%), three buildings with three female owners (1.3%), seven buildings with two female owners (3.1%), female owners There were 42 buildings (18.6%) with one person and 171 buildings (75.7%) without a female owner. Commercial Area, 66 stores (22.5%) had owners over 71 years old, 126 stores (43.0%) between 61 and 70 years old, and 64 stores (21.8 years old) between Looking at the age of store owners in Gunsan Public 51 and 60 years old and 15 stores (5.1%) for those aged 46-50 years and 22 stores (7.5%) for those under 45 years of age.

Table 5: Standard Median Income (KRW/Mon)

Number of household members		One person	Two person	Three people	Four people	Five people	Six people
Base median income	`17	1,652,931	2,814,449	3,640,915	4,467,380	5,293,845	6,120,322
	`18	1,672,105	2,847,097	3,683,150	4,519,202	5,355,254	6,191,307
	`19	1,707,008	2,906,528	3,760,032	4,613,536	5,467,040	6,320,544
	`20	1,757,194	2,991,980	3,870,577	4,749,174	5,627,771	6,506,968

4. Appropriate Store Size for the Resilience of Commercial Districts

4.1. Appropriate Demand.

In order to identify the customer group of Gunsan public, commercial districts, the population aged 15 or older in the administrative dong included in a radius of 2 km was counted based on resident registration population statistics. The floating population estimation sector was identified using the commercial district information system operated by the Small Business Market Promotion Foundation.

In the location analysis, information on the floating population within 25m based on the selected point was used as the aggregate standard. The average monthly expenditure was identified through a survey. However, there was a difference in the frequency of visits, so it was applied to the average monthly expenditure.

The study estimated the erasable size of the commercial area under study by calculating the size of the identified consumer spending.

The minimum margin was adjusted from around ±30~ 35% in consideration of the population size and economic feasibility based on median income as of 2020, and the minimum margin was set at 3 million won. Based on the 2020 statistics, the median income increased by 47.49 million won based on four-person households, and about

13.4 million won (2.86%) compared to 2019 (461.3 million won). The floating population of Gunsan in public, commercial district is estimated to be 46,950 per month, and the resident registration population, including adjacent administrative dongs, was 101,413. The registration of owners within the commercial district was based on the population of Jungang-dong, Heungnam-dong, Wolmyeong-dong, Gyeongam-dong, Samak-dong, Sinpung-dong, Susong-dong, and Jochon-dong.

Table 6: Gunsan Public Commercial Area - Customer Size (person) Area Population and Vacant Stores

Division	Customer size	Remarks (accounting standard)
floating population	46,950 people	Daily average of 1,565 people × 30 days
Economically active population (over 15 years old)	101,413 people	Jungang-dong (2,828 people), Heungnam-dong (10,428 people), Wolmyeong-dong (5,652), Gyeongam-dong (7,131), Samhak-dong (5,649), Sinpung-dong (6,859), Susong-dong (45,099 people), Jochon-dong (17,767 people)

The formula for calculating appropriate stores in the commercial district was newly modified. Total expected expenditure was calculated by multiplying the number of potential customers and the average monthly expenditure. Considering the size and economic feasibility of the population in the expected total expenditure, the study adjusted about 30~35%, and the value divided by the minimum margin was calculated as the appropriate number of stores. It was predicted through mathematical arithmetic based on the minimum margin of consumers and sellers, and is the first prediction model applied by Ryu (2021).

The model calculated the appropriate number of stores based on the minimum profits to be generated from the maintenance and operation of the current store based on the base income that can be paid in the region and the economically active population at this time. This model basically has characteristics that can vary depending on the size of the economy of consumers and the situation of the current store.

$$Z = \frac{(\alpha \times 35\%)}{d} \quad (1)$$

$$\alpha = \beta\left(\frac{\Sigma(\alpha_1 + \cdots + \alpha_n)}{n}\right) \quad (2)$$

z = Appropriate number of stores

d= Total expected expenditure

α= Minimum Profit Amount

β =Number of potential customers

$\left(\frac{\Sigma(C_1 + \cdots + C_n)}{m}\right)$= Average monthly expenses

The expected total expenditure was 153.4 million won per month, and the expected total expenditure calculated in consideration of the frequency of visits was 6910.75 million won based on the floating population, and 14,927.36 million won in terms of the resident registration population.

Table 7: Gunsan Commercial District - Expected Total Expenditure (person, 10,000 won)

Division		Average spend	Based on the floating population		Based on the resident registration population	
			Customer size	Expected total expenditure	Customer size	Expected total expenditure
		Ten thousand won	People	Ten thousand won	People	Ten thousand won
the entire		15.34	46,950	691,075	101,413	1,492,736
Monthly visits.	daily	-	-	-	-	-
	4 or 5 times a week.	8.00	227	1,814	490	3,919
	2 or 3 times a week.	20.82	3,856	80,291	8,329	173,431
	3-4 times a month.	16.17	17,691	286,009	38,214	617,786
	1-2 times a month.	15.89	18,599	295,536	40,173	638,363
	Once or twice a quarter.	9.83	5,443	26,764	11,758	57,810
	2-3 times a year.	2.75	907	624	1,960	1,347
	Less than once a year.	2.00	227	36	490	78

In calculating the appropriate shopping mall, the expected gross margin based on floating population was estimated at 20,73.22 million won, and the following appropriate number of stores was calculated as 691. It was analyzed that there are currently 555 operating malls in the Gunsan Public Commercial District, and there are no problems even if 136 shopping malls are added or expanded in the future. Furthermore, when calculated based on the resident registration population, the expected gross margin is estimated to be 447,821 million won, and about 1,493 shopping malls are analyzed as appropriate.

Table 8: Gunsan Commercial District-Appropriate number of Stores (KRW 10,000, unit)

Division	Expected total margin	The right number of stores	The current number of stores
Floating population	207,322 ten thousand won	691unit	555unit
Economically active population (over 15 years old)	447,821 ten thousand won	1,493unit	

Although there are 555 currently operating stores, it was analyzed that an appropriate commercial district could be maintained even if 136 stores were expanded due to predicting appropriate stores based on floating population. If we look at the number of stores that industry can add, there are 20 for seafood, 19 for neighborhood living services, and 18 for processed food and other retail businesses. The food and beverage industry was analyzed in the order of 16, and on the contrary, in the case of livestock products, there were 21 and 51 household goods, showing a small number of possible stores. Second, as a result of predicting appropriate stores based on the economically active population, it was analyzed that a good commercial area could be maintained even if 938 stores were expanded. By the industry, 140 fisheries products, 134 neighborhood living services, 125 processed foods, 122 other retail businesses, and 110 food business was interpreted based on the research.

Table 9: Gunsan Commercial Area – Appropriate Number of Stores by Industry (number, %)

Division		Now	Floating population		Economically active population	
		Number of stores	Number of stores	Gap	Number of stores	Gap
Total		555	691	136	1,493	938
By industry.	Agricultural produce	58	72	14	156	98
	Livestock products	17	21	4	46	29
	Aquatic products	83	103	20	223	140
	Processed food	74	92	18	199	125
	Clothing and Shoes	66	82	16	178	112
	Household	41	51	10	110	69
	Restaurant business	65	81	16	175	110
	Other retail businesses	72	90	18	194	122
	Neighborhood life service	79	98	19	213	134

5. How to Overcome the Gentrification and the Resilience of Commercial District

5.1. Descriptive Statistics

Using Gunsan public, commercial districts, consumers, and sellers survey their opinions on the activation and gentrification of commercial districts through 1:1 interviews. In order to secure the purchasing characteristics of consumers and the reliability of the survey, a survey was conducted by age group.

Table 10: Current Status of Survey

Division		Number of survey cases(%)	
Total		207	100.0
Gender	man	65	31.4
	woman	142	68.6
Age group.	10s	0	0.0
	20s	19	9.2
	30s	25	12.1
	40s	59	28.5
	50s	58	28.0
	Over 60s	46	22.2

The survey period was from November 25 to November 30, 2019, and 207 people were surveyed over six days. In order to increase the resilience of the commercial district, the survey was conducted on the ratio of online shopping, facilities necessary items for additional visits, and measures to prevent gentrification for the expanded revitalization of the commercial district. The survey was analyzed with a maximum tolerance of ±6.9%p at the 95% confidence level.

5.2. The Resilience of the Commercial District

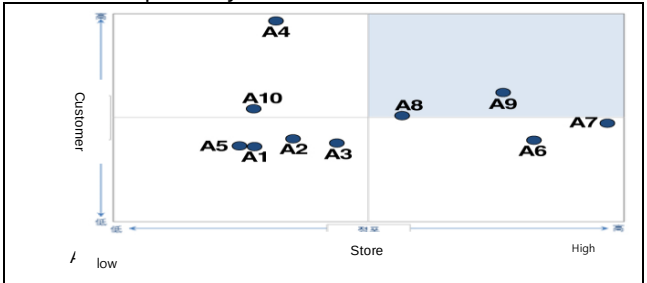
Matrix analysis was conducted through the store response axis (X-axis) and customer response (Y-axis) for the resilience of the Gunsan public, commercial district, which is the study target area. Based on the priority, the study was analyzed that it is most necessary for the resilience of commercial districts in the order of linking online (non-face-to-face) traditional markets located on the first quadrant, followed by establishing a national commercial district information platform, and strengthening local communities.

Table 11: Commercial District Resilience Items

	Item
A1	Accessibility to public transportation.
A2	Urban regeneration, etc
A3	Improving the structure of the commercial district.
A4	Diversification of businesses in commercial districts.
A5	Development of the representative contents of the commercial district

	Item
A6	Online market connection
A7	National commercial district information platform
A8	Utilizing local resources.
A9	Strengthen the community.
A10	Linking with customer facilities

Table 12: Top Priority for Activation



Store high, Client high	A6,A7,A9	Store low, Client high	A4
Store high, Client low	A8	Store low, Client low	A1,A2, A3,A10

Table13: Comprehensive Ranking of Measures for Activation

Store high, Client high	A7, A9	Store low, Client high	A2, A3, A4, A10
Store high, Client low,	A5, A6, A8	Store low, Client low	A1,

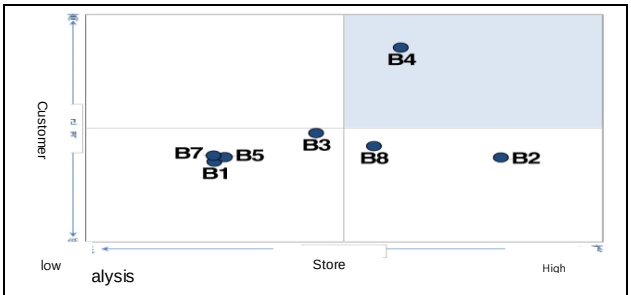
5.3. The Resilience of the Commercial District

The Gunsan public, commercial district, the target area of the study, conducted an IPA analysis on measures to prevent gentrification. Matrix analysis was conducted through the store response axis (X-axis) and customer response (Y-axis). Based on the priority, it was analyzed that the first quadrant needed to strengthen the Commercial Lease Protection Act. In other words, the strengthening of the Commercial Lease Protection Act can be explained as a priority to prevent gentrification in Gunsan commercial districts. In addition, as a comprehensive measure to prevent gentrification, it was analyzed that the gentrification prevention plan was a firm tenant protection policy by estimating and compensating the contribution to revitalizing commercial districts, strengthening the Commercial Lease Protection Act, and designating rent-restricted areas.

Table 14: Commercial District Gentrification Prevention Items

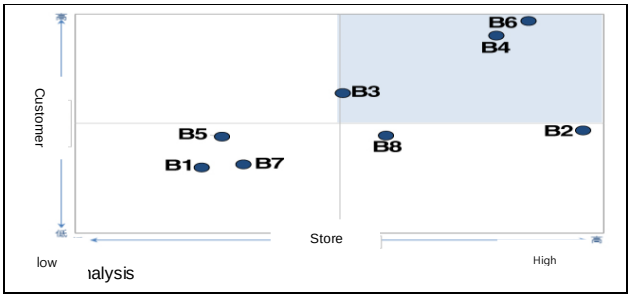
	Item
B1	Active public relations, including SNS
B2	Development of products in connection with work related to public institutions.
B3	Estimation and compensation of existing merchants' contributions to revitalizing commercial districts
B4	Reinforcement of the Commercial Lease Protection Act
B5	Preparation of a plan to manage the surge in rent through pre-sale rights, etc.
B6	Rent restriction zone designation.
B7	The community shares the value of the land
B8	Designating the area for the upper limit ratio of franchisees.

Table 15: First Priority for Preventing Gentrification



Store high, Client high	B4	Store low, Client high	-
Store high, Client low,	B2, B8	Store low, Client low	B1, B3, B5, B7

Table 16: Overall Ranking to Prevent Gentrification



Store high, Client high	B3, B4, B6	Store low, Client high	-
Store high, Client low,	B2, B8	Store low, Client low	B1, B5, B7

6. Conclusion

This study was held by targeting Gunsan-si, which had a good economic structure and the support of its local economy in Jeollabuk-do. Various industries have closed or relocated, which has led to tremendous damage to local and alley economies. Nevertheless, the area subject to empirical

research has been a central commercial district for residents since the past. When the number of empty stores in the area begins to increase gradually, it causes great damage to the area, like the law of broken windows. Until this phenomenon occurs, it is necessary to adjust the amount of store supply and supply timing because it occurs when demand and supply begin to show cracks. In the case of new cities, the supply amount can be adjusted in advance, but in the case of existing cities, it is very difficult to adjust the supply amount, so the current status and basic data of the commercial district can be provided to sellers who want to flow into the commercial district. Excessive competition between the same industries in the commercial district can be prevented, and other store vacancy factors can be correctly identified in the change in the commercial environment.

Commercial districts go through the path of revitalization and decline as consumers' interest increases, commercial districts become popular through expectations and spread, and consumers' interest falls as they face a turning point again. In the revitalization of commercial districts, there are no intellectual and problem, but as the decline progresses, empty stores begin to increase and lose competitiveness. In this process, as a large amount of budget and projects began to be invested to overcome competitiveness, consumers became interested again and gentrification occurred as store rent began to rise. Due to the outbreak of gentrification, efforts to overcome it again were often made to present short-term Prescriptions to solve Problems Easily and quickly rather than long- term plans for sustainable development and planning.

In order to overcome this problem, an empirical study was conducted in Gunsan, Jeollabuk-do.

As various cultural tourism projects have been promoted, many external tourists have begun to flow. However, as the gap between consumer demands and sales products was not narrowed, the degree of activation of commercial districts began to decrease compared to the past. In this situation, it is time to grasp the status of commercial districts and provide an opportunity to recover.

Therefore, in this study, the appropriate shopping mall size of the target area was identified based on the floating population and resident registration population (economically active population), and the maximum and minimum values could be presented in the study target area. Currently, 555 stores are in operation, but this specific commercial district can have a minimum of 136 stores and leading 938 stores. Currently, agricultural and livestock products account for about 28.5%, which is higher than other product items, and in order to be revitalized and resilient, a system should establish and utilize information platforms nationwide. In addition, the relationship between the community and shopping malls should be further strengthened.

In this situation, if continuous interest and efforts from sellers are added, store rent will increase. As a result, gentrification is expected to occur. Similar to the trend of major commercial districts in Korea, resilience could deteriorate, so institutional mechanisms should be strengthened to solve this problem. Next, numerous concerns and social consensus, such as designating rent restrictions, have been suggested, and those are the parts that people should have to consider deeply. Due to the characteristics of small and medium-sized cities in Korea, commercial districts with reduced resilience must be accompanied by many efforts to find vitality. It is believed that local commercial districts will have resilience when diagnosis and recovery measures based on this are adequately presented.

Meanwhile, there are currently insufficient conditions and measures for gentrification to induce a voluntary ecosystem in the commercial district. Numerous studies and concerns will have to be followed to limit its institutional regulations. Nevertheless, this study can be of great significance in that it preemptively identified these problems. looking at the characteristics of the downtown area, the number of empty shops is increasing due to the decrease in attractive factors and the decrease in the economic activity population and the floating population.

The government should also establish a system to prevent overlapping investments in the same region, and it is necessary to continuously provide store data to create sustainable conditions and ecosystems based on these investments. In addition, if an institutional device for shopping mall development is also prepared so that the supply and demand of shopping malls can be properly maintained, a dual device will be prepared.

6.1. Limitations of the Study and Future Studies

This study used the commercial area of small and medium-sized cities as a research target site. Since the domestic situation shows many differences between the metropolitan area and the provinces, it is believed that different results will be derived if such research is conducted depending on the size of the city or commercial area by selecting a representative area. In addition, the comparative analysis should be conducted by establishing commercial district data so that continuous commercial district management can be carried out through follow- up management in time series.

I addition, since the size of stores is not standardized by industry, there is a limitation in that additional factors such as sales type and product characteristic factors could not be found. If these factors are added in future studies, it will have an important solution for the increase or decrease of

empty stores.

Finally, it can be pointed out as a limitation: after comparing and analyzing measures and methods to solve the gentrification problem through various cases, alternatives suitable for local conditions and situations were not presented. These will have to be supplemented in future studies to conduct the research continuously.

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