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Housing Policy for Current Real Estate Market Issues

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01 Korean *Jeonse* System, Risk of *Jeonse* Leveraged Investments, and Policy Implications

Jinbaek Park

1. Understanding the Korean *Jeonse* System and Its Changing Nature

■ *Jeonse,* a unique housing rent system in Korea

According to the 2022 Korea Housing Survey, the total number of households in Korea is 21.45 million, of which 12.33 million live in their own houses, 8.32 million in rented houses, and 800,000 in houses for free. A total of 3.31 million of the households living in rented houses live under the system called *jeonse*, which allows them to pay no monthly rent if they pay more than 50-70% of the housing price as a deposit, while 5.01 million pay rent for housing on a regular basis.

While the *jeonse* system has been around in Korea for a long time, it became widespread during the country's industrialization period after the Korean War, when the population flocked to urban areas, such as Seoul, which caused a surge in housing demand and a shortage of housing supply in absolute numbers. Landlords rented out extra rooms in their houses to tenants and asked for a deposit, instead of monthly rent. *Jeonse* benefited tenants as they did not pay monthly rent and received the full amount of the deposit back at the end of their contract. Moreover, landlords could obtain available money equivalent to more than 50-70% of their housing price without taking out loans from financial institutions. Since it was during the period of double-digit high interest rates, they could generate income with the high interest rates without receiving monthly rent if they put *jeonse* deposits in banks.

Since *jeonse* was a system that benefited both landlords and tenants, it established itself as a common form of housing lease in Korea during the period when there was a shortage of housing supply in absolute numbers and housing finance was not very developed.

■ Transformation in the nature of the *jeonse* system

Jeonse was a concept that allowed tenants to deposit their available money with landlords without incurring any loss. The trade-off for tenants was potential interest income from banks. Since tenants could obtain their full deposit back at the end of the contract and buy a house with the money they saved from their income while being on *jeonse*, the *jeonse* system helped them to move up the housing ladder.

The role of *jeonse* as the housing ladder began to collapse when *jeonse* loans became more common. If *jeonse* were to help tenants to move up the housing ladder, the *jeonse* deposit had to be their own money, which resulted in no monthly expenses. The deposit must be used to buy their own home later on if tenants were to move up the housing ladder. As tenants took out loans to pay for the deposit, they paid monthly interest to banks, and they had to pay the deposit back to banks even if they got the deposit back at the end of the contract. Such interest payments reduced their real income, and they had no deposit left to use to move up the housing ladder. The loan-based *jeonse* system was no longer working as a tool to move up the housing ladder.

2. Extreme Leverage Structure in *Jeonse* - Gap Investment

■ Theoretical structure of the *jeonse* system – Operating income hypothesis vs. leverage hypothesis

In the early days of the *jeonse* system, landlords were able to generate large profits by depositing *jeonse* deposits in banks thanks to high interest rates. From this perspective, there may not have been much incentive to opt for *jeonse* if Korea did not experience the Korean War, and subsequently, there was no serious shortage of housing or infrastructure and the interest rate was not hiked above 20% during the industrialization period. In other words, the conditions of the historical period made the supply of *jeonse* possible. This perspective still argues that cutting interest rates in Korea would reduce the supply of *jeonse*. The theoretical structure of this explanation is referred

to as the operating income hypothesis.

From the demand perspective, financing a *jeonse* deposit through loans becomes a huge burden when interest rates are high. Therefore, tenants with much available money are incentivized to opt for *jeonse.* When interest rates are lowered, however, the cost of financing a *jeonse* deposit is lower, which may increase demand for *jeonse. Jeonse* consumption turns into a more common form of consumption compared to conditional consumption during periods of high interest rates. As seen above, low interest rates may increase demand for *jeonse*. Although there is no incentive to provide *jeonse* under the operating income hypothesis, an incentive to supply *jeonse* exists if the landlord views capital gains from the sale of their home, not interest from banks, as their income. If demand for *jeonse* is sustained by low interest rates, an incentive to supply *jeonse* exists if housing prices continue to go up. The theoretical structure from the above explanation is known as the leverage hypothesis.

■ Emergence of extremely leveraged gap investments

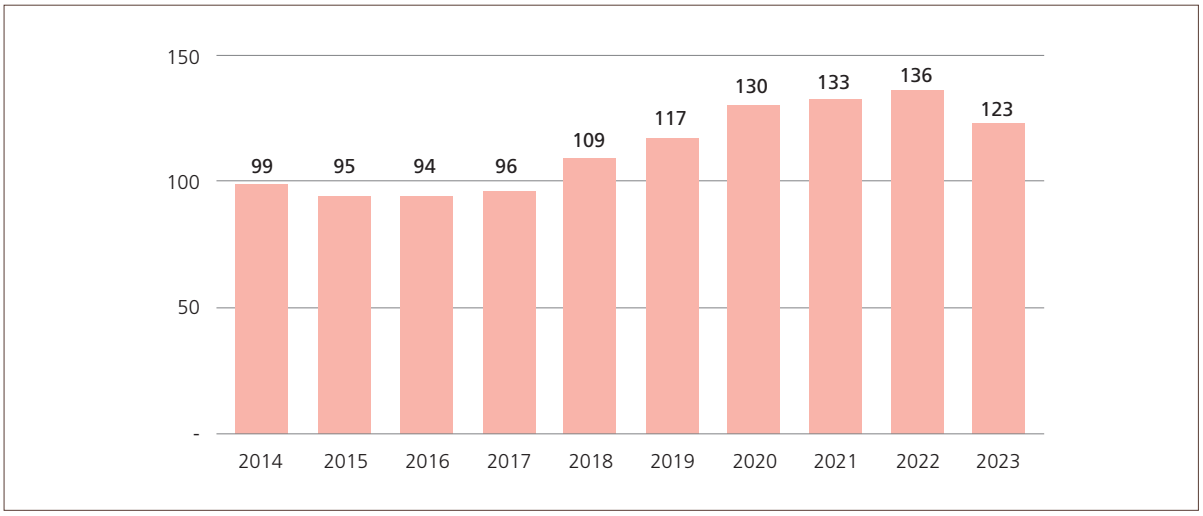
Then, which hypothesis prevailed in the Korean *jeonse* system around 2020?

During the COVID-19 pandemic, Korea's monetary authorities maintained ultra-low interest rates around 0%. Under the operating income hypothesis, there must have been no incentive for increasing the supply of *jeonse*. The low interest rates at that time, however, significantly increased an incentive to opt for *jeonse* and led to a sharp increase in *jeonse* prices. Demand for *jeonse* was increased by the low interest rates, and the supply increased as people were seeking capital gains through sales. The low interest rate environment shifted the *jeonse* market to operate under the leverage hypothesis. In 2020 and 2021, when interest rates hit the lowest level in history, the number of *jeonse* transactions exceeded 1.3 million, the highest level since records began. **Figure 1**

During this period, a significant increase in leveraged house purchases occurred in Korea, in which the buyer bought a house rented on *jeonse* in the hope of selling it at a higher price later. In Korea, these leveraged investments are dubbed gap investments. The figure below presents the number of house purchases that took over *jeonse* deposits in the Targeted Adjustment Zone, a regulatory system operated in Korea, based on all available data on the sources of funds required to be reported at the time of a house purchase. Given that this number was compiled only in the Targeted Adjustment Zone and the number of house purchases made by taking over *jeonse* deposits increased significantly even in other non-regulated areas, speculative housing transactions through *jeonse* were quite serious in Korea. **Figure 2**

For the landlord who buys a house, the best option to generate the highest profits through leveraged investments like the above is to take advantage of a capital-free investment, where they accept *jeonse* at the same price as the sale price. Since interest rates for loans were at an all-time low at that time, tenants could afford to respond to landlords' *jeonse* price hikes due to low financing costs. Consequently, this resulted in many capital-free gap investments, which were considered extremely leveraged investments. The *jeonse* system not based on operating income would continue as long as there are the next buyers willing to pay more for houses or the next tenants

Figure 1. Trend of *jeonse* transaction volumes (10,000 housing units)



Source
Ministry of Land, Infrastructure, and Transport Real Estate Transaction Management System (MOLIT RTMS)

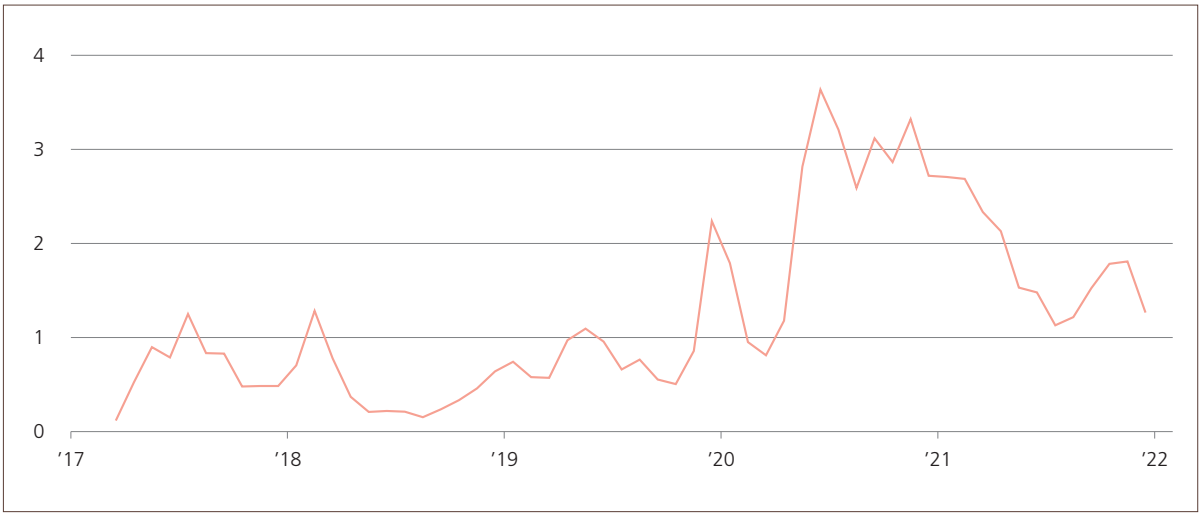
willing to pay more for *jeonse* deposits. They are in some sort of Ponzi scheme. This type of extremely leveraged investment may lead to a problem where the deposit cannot be returned at the end of the contract, if the housing price no longer rises, because there are no subsequent buyers or tenants who can afford to support the higher price. This is the root cause of *jeonse* scams, a serious social problem that manifested in Korea since the end of 2022.

3. Risk of Unreturned *Jeonse* Deposits

■ Estimation of the timing and level of unreturned *jeonse* deposits

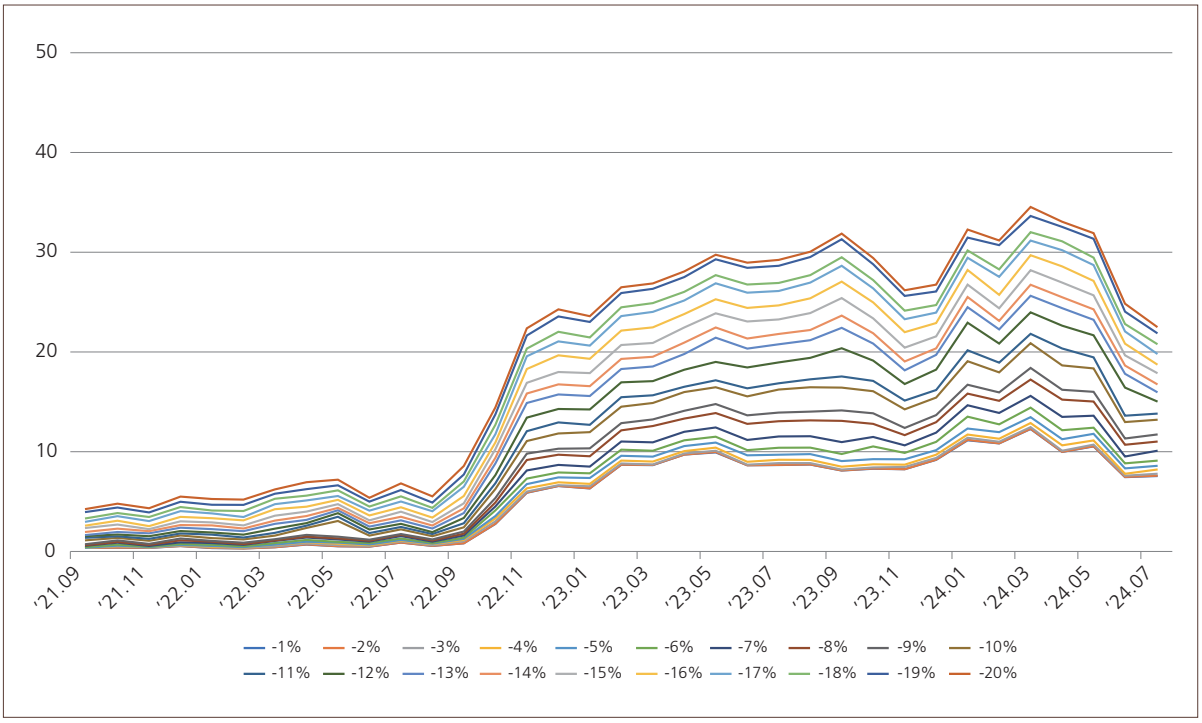
If leveraged *jeonse* investments were not to result in unreturned *jeonse* deposits, housing prices must continue to rise, and there must be the next buyers willing to buy houses at higher prices and the next tenants willing to pay at least the current deposit price. The problem is that Korea's ultra-low

Figure 2. Trend of *jeonse* deposit takeovers (gap investments) (10,000 housing units)



Source
Raw data from financing plans in the MOLIT

Figure 3. Estimated percentage of houses at the risk of unreturned *jeonse* deposits (%)



Source
Park, Kim, and Kwon. 2022.

interest rate policy in 2020 and 2021 greatly increased liquidity in the market, which led to inflation. When inflation goes up, monetary authorities raise the benchmark interest rate to absorb liquidity in the market. In Korea, the Bank of Korea (BOK) raised its benchmark interest rate in August 2021 in response to high inflation.

This study estimates the possibility and timing of *jeonse* leveraged investments in 2020 and 2021 developing into the risk of unreturned *jeonse* deposits under the scenario of a 1% to 20% decline in housing prices. The analysis predicted that the risk of unreturned *jeonse* deposits for leveraged *jeonse* investments increased explosively around October 2022 and persisted through 2024. In particular, the estimated number of *jeonse* contracts, where tenants cannot get their *jeonse* deposits back in the event of a 20% decline in the sale price, is as high as 40%. **Figure 3**

■ Phenomenon of unreturned *jeonse* deposits

As predicted, the number of unreturned *jeonse* deposits has increased more than ever before in Korea. This phenomenon is confirmed through the statistics of tenancy registration orders and *jeonse* deposit subrogation. Tenancy registration orders refer to a legal procedure for which the tenant files with the court to maintain the right of defense and priority in the event that the landlord fails to return the *jeonse* deposit. *Jeonse* deposit subrogation refers to cases in which the tenant who signs up for a *jeonse* deposit return guarantee with Korea Housing and Urban Guarantee (HUG) actually files an application for a return and receives the *jeonse* deposit back.

The graph below presents the trend of tenancy registration orders and *jeonse* deposit guarantee incidents. Similar to what was predicted, the number of tenancy registration orders increased sharply from October 2022, exceeding historical numbers. Similarly, the country witnessed a steep increase in the number of *jeonse* deposit guarantee accidents, for which HUG was subrogated, from September and October 2022. **Figure 4**

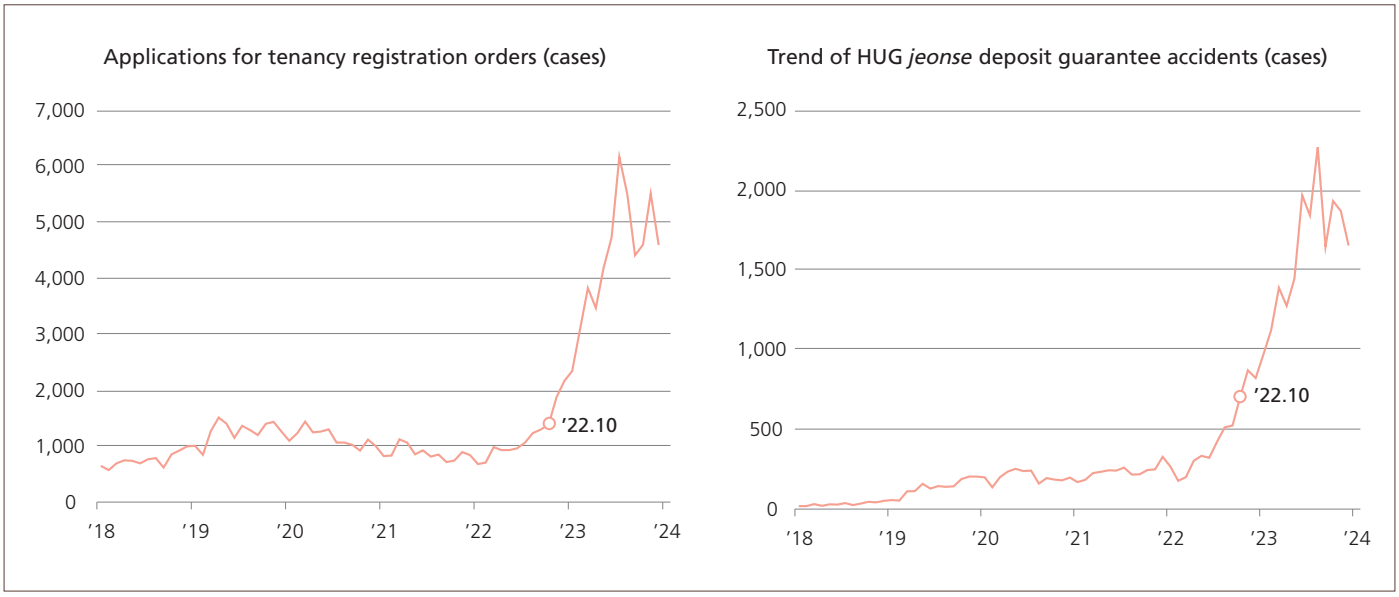
4. Policy Implications

■ Korean government's policy response

In Korea, the housing market began to decline in August 2022, and the risk of unreturned *jeonse* deposits worsened from the end of 2022. More importantly, there have been cases in which tenants committed suicide after they did not receive their *jeonse* deposits back. In response, the government called these cases *jeonse* scams and made various policy efforts to rescue the victims.

In addition, in response to the widespread problem of unreturned *jeonse* deposits, the Korean government introduced a loan system called the Special Housing Deposit Loan in January 2023 to provide loans that bypass debt service ratio (DSR) requirements without applying income criteria to loans for the purposes of returning *jeonse* deposits. With these

Figure 4. Statistics about unreturned *jeonse* deposits



Source Court of Korea (tenancy registration orders), HUG (*jeonse* deposit guarantee accidents)

efforts, the decline in *jeonse* prices has slowed since mid-2023. However, these loans that assist in the return of *jeonse* deposits merely postpone the timing of the repayment, rather than offering a fundamental resolution. If *jeonse* prices do not increase sufficiently in 2025, when the *jeonse* contracts signed in 2023 mature, there could be a risk that the deposit return loans will default. Policies introduced in 2023 are nothing but a temporary solution.

■ Directions for fundamental improvements in the system

Jeonse in Korea used to be a type of non-institutionalized financial transaction between individuals during a severe shortage of housing, and during this period, landlords put *jeonse* deposits in banks to earn extra interest income. After 2000, when public guarantees began to be provided to cover *jeonse*, the system developed into a loan-based system and triggered leveraged investment behaviors. While public guarantees have made lending possible, some consider that it is still private financing, which is not true. Currently, it would be better to consider *jeonse* loans to be public financing backed by public guarantees. From this view, managing *jeonse* loans to prevent excessive lending is very important, and for the government to promote the system with *jeonse* loans as part of housing support for working-class people is especially not desirable. In Korea, *jeonse* loans are not currently included in DSR requirements. *Jeonse* loans should be included in DSR requirements to ensure that the loans are provided according to the borrower's income level in line with international standards. *Jeonse* deposit return loans should also be included in DSR requirements phase by phase.

Furthermore, having a structure where people with low capital who cannot return a *jeonse* deposit are allowed to buy and rent out a house is not desirable. Given that some people even killed themselves as a result of *jeonse* scams in Korea since 2022, capital-free investment should never happen again. To regulate such extreme leverage behaviors, requiring those doing housing lease business to obtain a notarized proof of their financial soundness is crucial. More notably, the housing lease business needs to be institutionalized by requiring landlords to deposit a certain amount of deposit with a public institution when signing a lease contract.

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* This article is an overview of "Estimation on the *Jeonse* Leverage Risk and Policy Measures" by Jinbaek Park, Jeehye Kim and Geonwoo Kwon. 2022. Sejong: Korea Research Institute for Human Settlements.

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02 A Study on the Causes of and Countermeasures to Changes in Unsold Housing

Gwanseok Hwang, Jeehye Kim, Yun Sang Lee

1. Current Status of Unsold Houses and Reason for Fluctuations

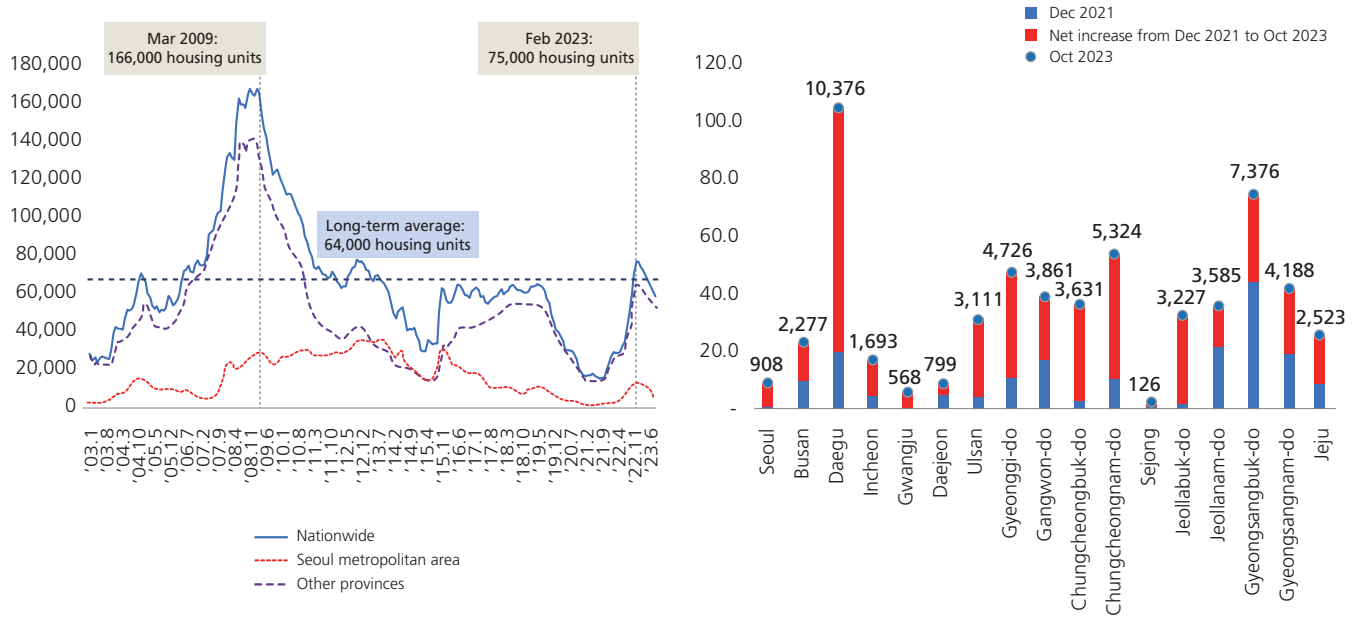
■ Unsold houses have been on the rise since the second half of 2022 due to various factors including rapid interest rate hikes and oversupply

After reaching a nadir of 14,000 housing units in September 2021, the number of unsold houses across Korea increased to 75,000 housing units in February 2023, which was above the long-term average (64,000 housing units for 20 years). That number, however, fell again to 58,000 housing units as of October 2023 due to a decrease in new home sales (see the left side of Figure 1). By region, unsold houses are mostly located in provinces outside the Seoul metropolitan area, such as Daegu (10,376 housing units), Gyeongsangbuk-do (7,376 housing units), and Chungcheongnam-do (5,324 housing units) (see the right side of Figure 1). In March 2009, during the Global Financial Crisis, unsold houses exceeding 85 ㎡ accounted for 56.6% of the total, whereas unsold houses between 60 and 85 ㎡, which are in great demand from potential home buyers, accounted for 71.5% of the total as of October 2023, suggesting that unsold houses are more likely to be sold if market conditions improve or the government provides some support. Figure 1

■ Causes for fluctuations in unsold houses include the oversupply of housing, high interest rates, and government policies, and vary by period and region

To analyze the causes of fluctuations in unsold houses, this study used a random effects model based on panel data

Figure 1. Fluctuations in unsold houses and distribution by region (units)



Source MOLIT Statistics System. Report on the Status of Unsold Houses. https://stat.molit.go.kr/portal/cate/partStts.do?stts=0150000

by city and province for the two periods: before and after the Global Financial Crisis from the first quarter of 2006 to the first quarter of 2015, and before and after the coronavirus disease 2019 (COVID-19) pandemic from the first quarter of 2015 to the first quarter of 2023. The analysis results showed that housing supply and liquidity had a statistically significant effect, and in particular, the effect of interest rates (liquidity) was greater during the COVID-19 pandemic than during the Global Financial Crisis. Table 1

2. Risk and Ripple Effect of Unsold Houses

■ Risk indicator for unsold houses categorized into four stages of normality, concern, entry into risk, and risk

The risk indicator of unsold houses can be evaluated by generating an empirical distribution with values ranging from 0 to 100 based on the long-term mean and standard deviation. In view of previous studies, including the Ministry of Construction and Transportation (2007), the Ministry of Land, Infrastructure, and Transport (2016), and Lee et al. (2022), as well as expert advice, the thresholds for the risk and crisis stages of unsold houses were classified into < long-term mean for the stage of normality, ≥ long-term mean for the stage of concern, ≥ long-term mean + 1 standard deviation for the stage of entry into risk, and ≥ long-term mean + 2 standard deviations for the stage of risk. Table 2

The analysis of the risk level of unsold houses showed that the Seoul metropolitan area was at the stage of normality, while the other provinces were at the stage of concern as of 2023. More specifically, compared to the peak of unsold houses in February 2023, the number of regions at or above the stage of entry into risk has decreased recently.

Nonetheless, other provinces, such as Daegu, Ulsan, Chungcheongbuk-do, Jeollabuk-do, Jeollanam-do, Gyeongsangbuk-do, and Jeju, remain at or above the stage of concern. Figure 2

■ The risk of unsold housing has a negative impact on the economy, including PF loan defaults and a decline in new housing starts.

As of September 2023, the total balance of project financing (PF) loans was KRW 134.3 trillion, a KRW 41.8 trillion increase from the end of 2020, and non-banks accounted for 67.1%, with KRW 44.2 trillion in PF loans to banks and KRW 90.1 trillion in PF loans to non-banks (securities companies,

Table 1. Results of panel analysis (random effects model) on the causes of fluctuations in unsold houses by period

	Before and after the Global Financial Crisis (2006 Q1 to 2015 Q1)		Before and after the COVID-19 pandemic (2015 Q1 to 2023 Q1)	
	Coefficient	t-statistic	Coefficient	t-statistic
Constant term	–0.480	–3.742 ***	–0.106	–0.409
LOG (housing construction permits (–3, 3 quarter moving average))	0.066	4.334 ***	0.070	2.360 **
CD rates (–1) (%)	0.087	7.214 ***	0.162	4.066 ***
LOG (GDP) (differential)	0.154	0.108	3.531	1.383
LOG (unsold houses (–1))	0.949	81.944 ***	0.896	52.133 ***
Adjusted	0.94		0.85	

Note
(1) The Apartment Price Index was excluded from the analysis due to its endogeneity with other variables, and the model was set to include the time lag term to control for autocorrelation.
(2) *, **, *** means being significant at the 10%, 5%, and 1% statistical significance level, respectively.
Source
Created by authors

Table 2. Classification of crisis stages as an unsold housing risk indicator

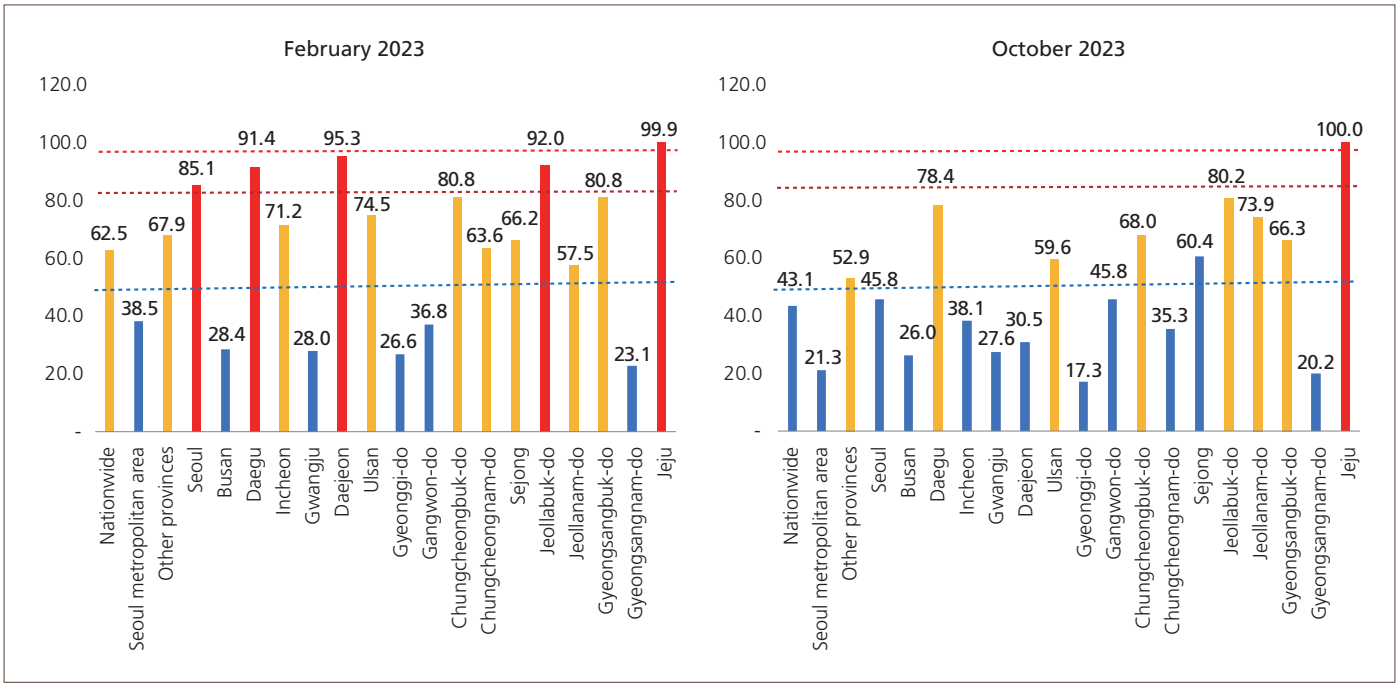
Crisis stage for unsold housing	Threshold	Risk indicator level
Stage of risk	≥ Mean + 2 standard deviations	≥ 97.1
Stage of entry into risk	≥ Mean + 1 standard deviation to < mean + 2 standard deviations	≥ 84.1 to < 97.1
Stage of concern	Mean to < mean + 1 standard deviation	≥ 50 to < 84.1
Stage of normality	< Mean	< 50

Source
Created by authors

insurance companies, savings banks, and financial cooperatives other than banks) (Financial Services Commission, Financial Supervisory Service 2023b). Across financial institutions, the delinquency rate was 2.42% as of the end of September 2023, a 1.23% increase from the end of 2022, and for financial cooperatives in particular, the delinquency rate rose from 0.1% at the end of March 2023 to 4.18% at the end of September (Financial Services Commission, Financial Supervisory Service 2023a; 2023b). It is worth noting that the delinquency rate among securities companies has gradually increased since the end of 2021 to 17.28% at the end of June 2023 and 13.85% at the end of September 2023. Figure 3

While the bankruptcy rate in the construction industry remained healthy (12 companies of which 6 were general construction companies and 6 were specialized ones) between January and October 2023, the number of construction

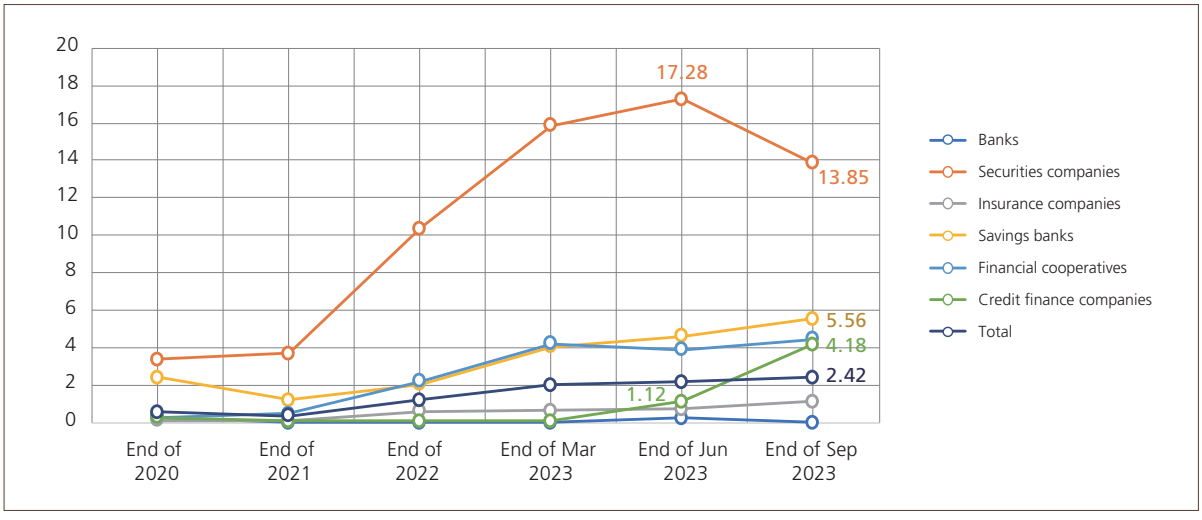
Figure 2. Unsold housing risk indicator and crisis stage assessment by region and province (February 2023 vs. October 2023)



Note The dotted lines represent the crisis stages based on the empirical distribution, with the blue line at the bottom referring to the threshold for the stage of concern, the brown line in the middle referring to the threshold for the stage of entry into risk, and the orange line at the top referring to the threshold for the stage of risk.

Source MOLIT Statistics System. Adapted by these researchers from the Report on the Status of Unsold Houses (https://stat.molit.go.kr/portal/cate/partStts.do?stts=0150000, Accessed on Dec. 8, 2023)

Figure 3. Trend in the delinquency rate in PF loans



Source
Prepared by these researchers based on the Financial Services Commission, Financial Supervisory Service, July 2023; Financial Services Commission, Financial Supervisory Service, Sept. 2023.

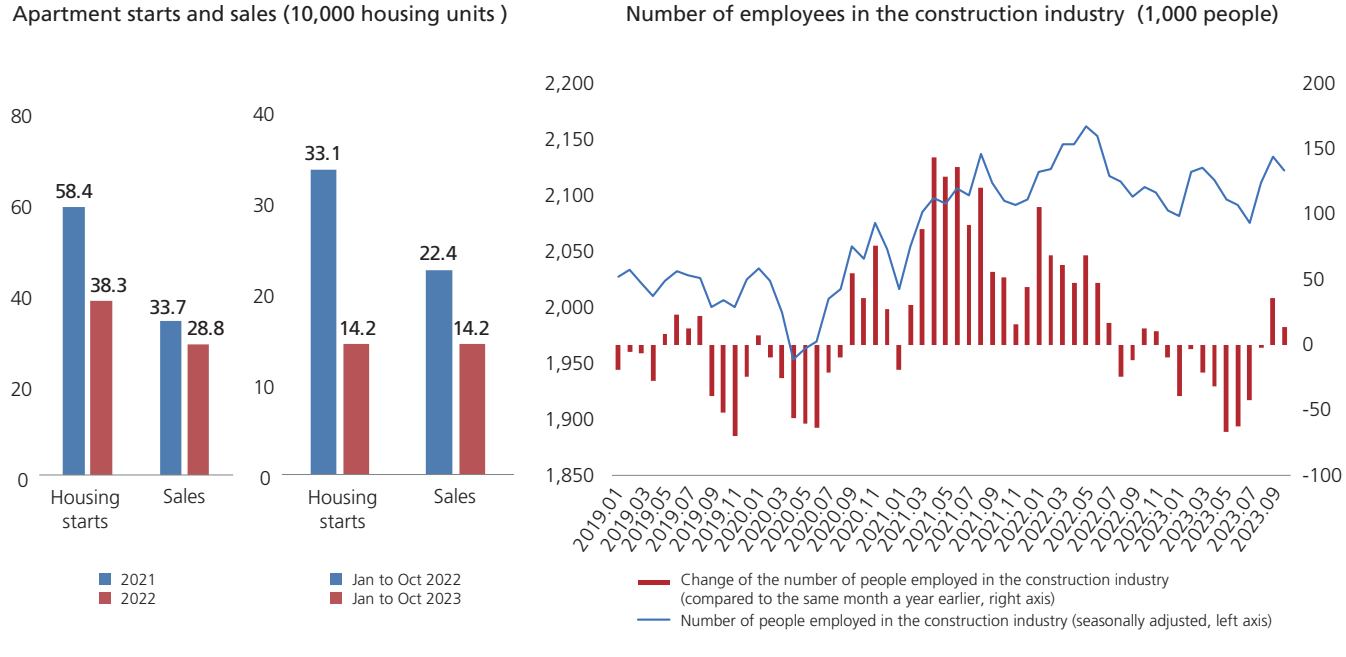
companies that went out of business increased to 326 during the same period, up from 179 a year earlier.[01] Housing starts nationwide declined in 2022 on a year-over-year basis and fell to 142,000 housing units from January to October 2023, a 57.2% decline from the same period the previous year (331,000 housing units). Apartment sales also dropped to 142,000 housing units between January and October 2023, a 36.5% decline from the same period the previous year (224,000 housing units). A decline in new housing starts led to decreased employment in the construction industry, which lost 66,000 jobs in May 2023 from a year earlier but posted a slight increase of 14,000 in October 2023. **Figure 4**

3. Directions in Policy Responses to Tackle Unsold Houses by Crisis Stage

■ **Most members of the public responded negatively when asked whether policies to resolve unsold houses were necessary.**

On the question of whether the government's support is needed for unsold houses, some have adopted a positive view that the government's support is necessary because unsold houses can have an adverse effect on the financial situation of construction companies, potentially resulting in a series of bankruptcies among these companies, spreading contagion among financial institutions, discouraging housing supply in the private sector, and undermining the local economy and housing stability. On the other hand, some take the negative view that the government's support for unsold houses caused by poor business decisions or reckless business expansion may encourage a moral hazard among construction companies. Nationwide, 59.1% of households (68.8% of real estate agencies) said that unsold houses should be left to the market, indicating opposition to the government's effort to resolve the situation of unsold houses (see Figure 5). When it came to policies to be prioritized if the government intervened to resolve the issue of unsold houses, 70.5% of households (76.2% of real estate agencies) preferred support policies to provide tax benefits to the buyers of unsold houses. **Figure 5**

Figure 4. Housing starts and sales (left) and the number of people employed in the construction industry (right)



Source Statistics of Housing Construction and Sales from MOLIT Statistics System. https://stat.molit.go.kr/portal/main/portalMain.do; Economically Active Population Survey from Korean Statistical Information Service. https://kosis.kr/index/index.do

01. MOLIT Statistics System. Number of bankruptcies in the construction industry. https://stat.molit.go.kr/portal/main/portalMain.do; Knowledge Information System of Construction Industry. Number of business closures in the construction industry. https://www.kiscon.net/cis/siljuk_apply_noplugin.asp

■ Directions in policy responses to tackle unsold houses by crisis stage

As of October 2023, the number of unsold houses is slightly below the long-term nationwide average and mostly at a manageable level. The number, however, is likely to increase for some years to come, depending on whether interest rates remain high for much longer, whether the supply of new houses for sale increases, and a potential economic downturn, and it is, therefore, important to prepare a preemptive response strategy by crisis stage. When it comes to supporting construction companies, however, such support must be contingent on them putting in place their own efforts.

(1) Stage of concern: ≥ 64,000 housing units nationwide

Focus on indirect support for suppliers by providing liquidity, along with existing support policies for home buyers. Apply the debt service ratio (DSR) regulation on an exceptional basis (to loosen it to the level of the debt-to-income (DTI) regulation) to ease the burden on real first-time home buyers, and strengthen support for long-term and low-interest loans for buying houses. Prevent PF loan defaults by continuously providing liquidity to financially sound projects, and encourage PF projects in competitive business clusters.

(2) Stage of entry into risk: ≥ 99,000 housing units nationwide

Implement policies to support potential buyers, including reducing acquisition and transfer tax when purchasing unsold houses, provide additional support to buy-to-rent operators, and boost private-sector real estate investment trusts (REITs). In particular, for REITs based on private-sector funds, it is difficult to do business due to excessive tax burdens, including acquisition tax and comprehensive real estate holding tax. Hence, it is necessary to provide policy support to reduce tax burdens, including acquisition tax and property tax, based on the previous case of the Global Financial Crisis.

(3) Stage of risk: ≥ 134,000 housing units nationwide

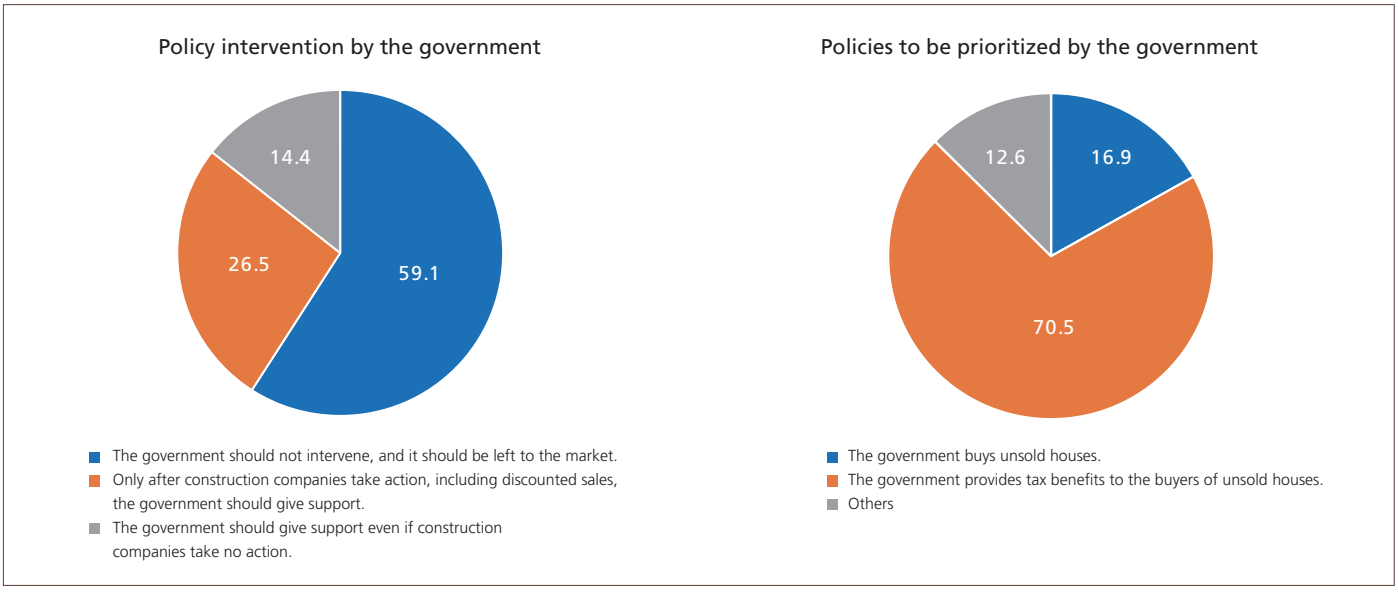
Strengthen support for actual buyers and focus on direct support for suppliers, including the public purchase of unsold houses (conditional on buy-to-rent and buyback). If it is possible to implement differentiated policies by region, the public purchase policy should be partially applied to the risk areas or *si, gun*, and *gu* with more than 2,000 unsold housing units.

■ Responses considering the distribution characteristics and fluctuation causes of unsold houses

As small and medium-sized unsold houses account for a high percentage of the total, and the causes of fluctuations vary depending on the region due to rapid interest rate hikes, high sales prices relative to inventory prices, and oversupply, it is necessary to consider the distribution characteristics of unsold houses and the causes of fluctuating housing prices.

First, given that 71.5% of the unsold houses are small and medium-sized (60–85㎡), which actual buyers prefer, it

Figure 5. Survey on the perception of participants in the real estate market regarding policy support for unsold houses



Source Korea Research Institute for Human Settlements. Survey on the Perception of Participants in the Real Estate Market Regarding Policy Support for Unsold Houses (Households and Real Estate Agencies). Feb. 2023.

is necessary to implement demand-based support policies for actual buyers and buy-to-rent support policies. With tax and financial support for actual buyers along with voluntary solutions prepared by construction companies, such as lowering sales prices, it is necessary to minimize the conversion of unsold houses before completion into *unsold houses after completion*, also known as "malicious unsold houses." It would also be necessary to use unsold houses for buy-to-rent projects by the Korea Land and Housing Corporation (LH) or 10-year public rental housing projects, which allow houses to be converted into sales.

Second, for projects with an increased number of unsold houses due to rapid interest rate hikes and high sales prices compared to inventory housing prices, it is important to provide liquidity until the interest rates stabilize provided that voluntary solutions are prepared by developers and construction companies, and to maintain a stable housing supply by normalizing real estate PF business. Due to a surge in interest rates starting in the second half of 2022, PF loan interest rates have risen significantly, while new PF loans have decreased. Also, construction starts have decreased significantly, leading to a decrease in unsold houses. It is, therefore, necessary to continue to support real estate PF in financially sound projects to address uncertainty about housing supply in the future. Although the housing market downturn led to a significant decline in inventory housing prices, construction costs increased substantially and undermined the competitiveness of sales prices relative to inventory housing prices. It is, therefore, important for construction companies to reduce sales prices voluntarily.

Third, to respond to the oversupply of housing by region, it is crucial to push for supply management policies in some regions, such as Daejeon, Jeollanam-do, and Daegu, where the number of permits in recent years increased greatly above the long-term average. By city and province, the number of housing construction permits in the last three years (2020–2022) was 1.60 times higher than the long-term (2006–2022) average in Daejeon, 1.32 times higher in Jeollanam-do, 1.24 times higher in Daegu, and 1.13 times higher in Jeollabuk-do.

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03 Spatial Segregation by Housing Prices and Its Policy Implications

Yun Sang Lee

1. Concept and Issues of Residential Segregation by Housing Prices

■ Concept of Residential segregation by Housing Prices

Residential segregation by housing prices refers to the observable separation between high-priced and low-priced housing within a city. Residential segregation encompasses the phenomenon of different population groups residing in distinct housing spaces (Yoon 1998; Massey and Denton 1988; Reardon and O'Sullivan 2004). Research on residential segregation by income has attracted considerable international attention; however, obtaining precise income data for each city in Korea poses challenges. A practical alternative involves exploring residential segregation by housing prices, considering their close correlation with income.

■ Problems Arising from Residential segregation Due to Housing Prices

Residential segregation by socioeconomic class or housing prices leads to varying levels of living environments based on a household's economic standing or capacity to afford housing. In more extreme scenarios, this segregation can contribute to the inheritance of socioeconomic status. For instance, neighborhoods with a higher concentration of educated residents or those with elevated housing prices typically exhibit elevated academic standards and a healthier level of academic competition among students. Conversely, a different scenario unfolds in neighborhoods with fewer educated individuals or lower housing prices. In such instances, the household's socioeconomic class or the capacity to acquire a home influences the children's academic performance and socioeconomic status. Previous studies by Choi (2004a, 2004b) and Song (1992) have provided partial evidence of the intricate connection between neighborhood socioeconomic class, housing prices, and children's academic achievement in urban areas. These findings imply that factors beyond education may contribute to disparities in the quality of living environments. Further, studies by Song and Lee (1993) and Lee and Seo (2009) have partially demonstrated a correlation between the neighborhoods' socioeconomic level and the provision of local public goods.

■ Measurement Index for Residential segregation

The assessment of residential segregation by housing prices involves the evaluation of two key dimensions: evenness and clustering. Evenness is quantified using the Gini coefficient; clustering is assessed through Moran's I, and a spatial Gini coefficient, encompassing both evenness and clustering, offers a comprehensive perspective. The measures proposed by Massey and Denton (1988) include evenness, exposure, concentration, centrality, and clustering. However, these have primarily focused on residential segregation by race, which is a categorical variable. In the context of residential segregation by continuous variables such as income or housing prices, the primary focus shifts to measuring evenness and clustering. Evenness gauges the equitable distribution of different groups across sub-areas within a city and is quantified using the Gini coefficient. Clustering assesses the spatial adjacency or concentration of different groups in a subset of the city and is measured by the Global Moran's I. For pinpointing specific clustered areas, Local Moran's I can be employed. Notably, a more recent development is the emergence of a spatial Gini coefficient, amalgamating both evenness and clustering into a unified index.

2. Methods and Results of Residential Segregation Measurement

■ Analysis Data

To assess the extent of residential segregation by housing prices, this study utilized publicly available housing price

data for major cities such as Seoul, Busan, Daegu, Incheon, and Daejeon. However, due to space constraints, this paper focuses its analysis solely on Seoul. For each city, it compiles the average publicly available housing prices based on the National Basic Districts defined by the Ministry of the Interior and Safety (MOIS), utilizing these values in the analysis.

■ Methodology and Results of Measuring Evenness Using the Gini Coefficient

The Gini coefficient serves as the metric for gauging the extent to which the publicly available housing prices are evenly distributed across subspace units within a city. It is calculated using the following equation (Rey and Smith 2013, 60), where x_i represents the average housing price in subspace unit i; n is the total number of subspace units, and $\overline{x}$ is the average of the average housing prices across all subspace units.

$$G = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}|x_i - x_j|}{2n^2\overline{x}}$$

The Gini coefficient, calculated based on average housing prices of the National Basic Districts in Seoul, decreased from 2011 to 2016 but subsequently increased from 2016 to 2021. **Table 1**

■ Methodology and Results of Clustering Measurement Using Moran's I

The Global Moran's I is employed to quantify the level of clustering in the average housing prices across subspace units within a city. It is calculated using the following equation (Anselin 1988, 101), where e represents the residual vector with values of $(x_i - \mu)$; N is the total number of samples, and W is the spatial weighting matrix.

$$\mathrm{I} = (\mathrm{N}/\sum\sum w_{ij})(\mathrm{e'We}/\mathrm{ee'})$$

Global Moran's I, calculated based on publicly available housing prices by National Basic Districts in Seoul, decreased from 2011 to 2016 and then increased from 2016 to 2021. **Table 2 Figure 1**

Local Indicators of Spatial Association (LISA) maps were generated using Local Moran's I, calculated as follows (Anselin 1995, 98) to pinpoint specific clustering areas within the city. Utilizing publicly available housing prices for each of Seoul's National Basic Districts, the clustering maps reveal distinct clusters of high-priced housing in the city's north-central and southeastern parts, with clusters of low-priced housing concentrated in the northeastern, northwestern, and southwestern outskirts.

■ Results of Using the Spatial Gini Coefficient to Simultaneously Measure Clustering and Evenness

To concurrently assess the clustering and evenness of residential segregation, this study computed the spatial Gini coefficient—a spatial decomposition of the traditional Gini coefficient. The spatial Gini coefficient breaks down the conventional Gini coefficient into two components: Gini coefficient between spatial neighbors and Gini coefficient between spatial units that are not neighbors. The second term, representing the Gini coefficient between spatial units that are not neighbors, is utilized as the spatial Gini coefficient. The Gini coefficient's spatial decomposition is expressed by the following formula (Rey and Smith 2013, 61):

$$G = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}|x_i - x_j|}{2n^2\overline{x}} + \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}(1 - w_{ij})|x_i - x_j|}{2n^2\overline{x}}$$

Table 1. Gini Coefficient of Publicly Available Housing Prices by Basic District in Seoul

Category	2011	2016	2021
Gini coefficient	0.314	0.300	0.376

Source
Compiled using joint and individual housing prices from the Ministry of Land, Infrastructure, and Transport (MOLIT) and basic district data from MOIS

Table 2. Global Moran's I Values in Seoul

Category	2011	2016	2021
Moran's I	0.613	0.590	0.620

Source
Compiled using joint and individual housing prices from MOLIT and basic district data from MOIS.

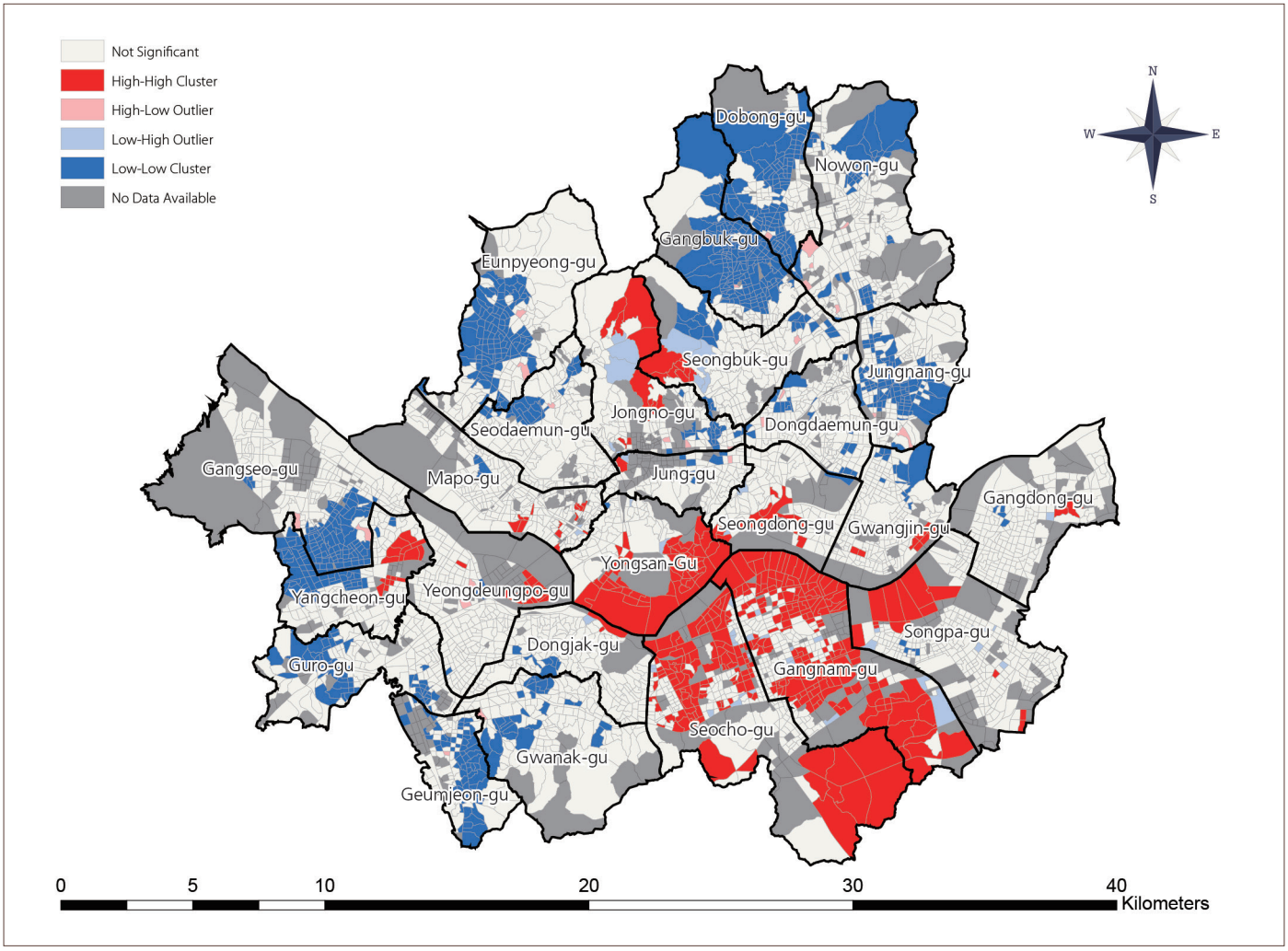
The spatial Gini coefficient, calculated based on publicly available housing prices by Seoul National Basic Districts, decreased from 2011 to 2016 and then increased from 2016 to 2021. Table 3

3. Exploring Changes in Residential Segregation: Case Study Area Analysis Results

■ Overview of Case Study Area Analysis

The analysis of case study areas seeks to understand the factors influencing residential segregation by housing prices. These areas, drawn from the National Basic Districts of Seoul and Daejeon, cover regions with recently expanded high-priced housing clusters, expanded low-priced housing clusters, shrunk high-priced housing clusters, and shrunk low-priced housing clusters. The primary research method employed for this investigation was focus group discussions.

Figure 1. Clusters of Publicly Available Housing Prices by Basic Districts in Seoul (As of 2021)



Note Red areas indicate clusters of high-priced housing, whereas blue areas represent clusters of low-priced housing.
Source Compiled using joint and individual housing prices from MOLIT and basic district data from MOIS.

Table 3. Spatial Gini Coefficient of Publicly Available Housing Prices by Seoul National Basic Districts

Category	2011	2016	2021
Gini coefficient	0.3142	0.3003	0.3762
Coefficient between neighbors	0.0004	0.0004	0.0005
Coefficient between non-neighbors	0.3137	0.2999	0.3757

Source
Compiled using joint and individual housing prices from MOLIT and basic district data from MOIS

■ **Summary of Analysis Results**

The analysis suggests that neighborhoods, consisting of detached houses, multi-unit houses, and multi-household houses, tend to transform into clusters of lower-priced housing within a city when they remain unaffected by large-scale new apartment complex construction and the associated changes in housing conditions. In the cases of expanded low-priced housing clusters and shrunken high-priced housing clusters, areas with relatively lower housing prices in or around the case areas predominantly feature detached houses, multi-unit houses, and multi-household houses, with no presence of apartment complexes or small, older complexes.

Reconstruction and redevelopment efforts for improving the living environment tend to result in increased housing prices due to the construction of new apartment complexes in the vicinity; hence, this is a contributing factor to residential segregation by housing prices. Areas characterized by relatively higher housing prices in or around the case areas, such as expanded high-priced housing clusters and shrunken low-priced housing clusters, are primarily affected by the construction of new apartment complexes resulting from reconstruction and redevelopment.

Transportation and living conditions emerged as additional factors influencing changes in residential segregation. Policy attention is warranted to enhance the transportation environment where government intervention is feasible. Areas experiencing expansion in high-priced housing clusters or contraction in low-priced housing clusters tend to have favorable transportation and living conditions. Conversely, areas with expanding low-cost housing clusters or shrinking high-cost housing clusters face the challenge of relatively poor transportation and living environments.

4. Implications and Applications of the Analysis

■ **High Spatial Clustering of Housing Prices and Clusters' Entrenchment**

The level of spatial clustering by housing prices in the five largest cities as of 2021 was notably high. The Global Moran's I for Seoul, Busan, Daegu, Incheon, and Daejeon in 2021 was 0.62, 0.45, 0.56, 0.60, and 0.49, respectively, indicating statistical significance and pointing to a relatively elevated level of spatial clustering. Over the three time points (2011, 2016, and 2021), Busan, Daegu, and Incheon consistently increased their Global Moran's I, while Seoul and Daejeon experienced a decrease followed by an increase. A comparison of the spatial distribution of low- and high-value housing clusters in the five metropolitan areas at the three time frames reveals their robust establishment.

■ **Identification of Residential segregation by Housing Prices and Increasing Levels of Residential segregation**

Residential segregation by housing prices is evident in the five metropolitan areas as of 2021, with Seoul approaching a state of severe residential segregation. As of 2021, Seoul, Busan, Daegu, Incheon, and Daejeon exhibited spatial Gini coefficient values of 0.38, 0.32, 0.30, 0.34, and 0.33, respectively, indicating the presence of residential segregation. Over the three time frames, Busan, Daegu, and Incheon consistently saw an increase in their Gini coefficients, which indicates a rise in residential segregation. Conversely, Seoul witnessed a decrease followed by an increase again, and Daejeon remained unchanged initially and then experienced an increase in its Gini coefficient.

■ **Policy Directions to Alleviate Residential segregation by Housing Prices**

Central or local governments should actively support the construction of large-scale new apartment complexes through redevelopment and reconstruction in low-income housing clusters. Such construction projects can attract younger residents and enhance the living environment by drawing in new shopping and convenience facilities. To facilitate the smooth redevelopment and reconstruction of low-cost housing clusters, the government and local authorities should provide support. Additionally, improving the local environment can be achieved by constructing light railways, increasing the likelihood of private redevelopment and reconstruction. Environmental enhancements in low-income housing clusters should be pursued concurrently with housing welfare policies, recognizing that such improvements may contribute to an increase in housing prices in these areas. While improving the living environment in low-income housing clusters and the subsequent rise in housing prices can help alleviate residential segregation by housing prices, it is essential to consider potential side effects, such as reducing the availability of affordable housing for low-income individuals. Hence, housing welfare policies encompassing affordable housing, public rental housing, and housing benefits for existing low-income tenants should be collectively promoted. When supplying affordable housing, such as public rental housing, planning is crucial to

ensure that the supply is distributed evenly across non-clustered areas and high-priced housing clusters, avoiding concentration in low-priced housing clusters.

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> “Central or local governments should actively support the construction of large-scale new apartment complexes through redevelopment and reconstruction in low-income housing clusters.”

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