Chapter 1. Introduction

*Jeonse*¹ is one of the most popular housing rental contracts in Korea and is not found elsewhere in the world. The *Jeonse* system is key to achieving an in-depth understanding of the Korean housing market. In the past few years, the *Jeonse* contract has rapidly withdrawn from commercial circulation. Simultaneously, *Jeonse* house purchase prices have increased. The Korean Government is attempting to stabilize the *Jeonse* price to improve housing security for the Korean people. However, studies focusing on the *Jeonse* price are lacking.

To date, the exact origin of the *Jeonse* system remains unknown. However, *Jeonse* was mentioned in a Social Customs Report written by a governor-general of the Chosen² in 1910: “*Jeonse* is the most popular housing rental contract in Chosen.”³ Thus, the *Jeonse* system was already in operation approximately 100 years ago.

*Jeonse* is a housing rental contract unique to Korea. Essentially, it is a repurchase agreement (repo) in which the landlord borrows from the tenant with the house as collateral⁴. The tenant pays the amount of 50 percent or 70 to 80 percent to the house owner, and the landlord grants the tenant the right of occupation. At the termination date, the tenant returns the house, and the landlord repays the exact initial nominal amount of money to the tenant. In the interim period, no cash payments are made by both parties⁵. Thus, the *Jeonse* system is considered not only a housing lease contract

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¹ *Jeonse* is also spelled “Chonsei”
² The Japanese Governor-General of Korea served as the chief administrator of the Japanese government in Korea while it was held as the Japanese colony of Chosen from 1910 to 1945.
³ Sources: governor-general of the Chosen 「Social Customs Report」, 1910
⁴ Ko Sang Yong, "A Study on the Protection of Tenants leasing Dwelling – House”, University of Sungkyunkwan 「Social Science Review」 Vol.17 No.1 pp5-50, 1979, re-quote
⁵ Se-Jik Kim(Seoul National University) & Hyun Song Shin(Princeton University), "Financing Growth without Banks: Korean Housing Repo Contract”, p. 3
from the house owner to the tenant but also a private loan contract from the tenant to the landlord.

Various causes of the development of Jeonse may be observable in Korea, but the system mainly consists of the following two factors: expectations for house price increase and lack of institutional housing finance market6.

At the early stage of economic development in the 1960s to 1970s, the rural district collapsed and urbanization accelerated, and the demand for houses(housing) in the city increased. In the 1980s, rapid economic growth further increased the urban concentration of population, and the demand exceeding supply led to a full-fledged house price increase. In the 1990s, the 2 Million Houses Construction Plan, which was implemented in the 1998 to 1992 period(five years), was carried out. To some extent, a massive supply of houses eased the gap between supply and demand for houses, undergoing improvement in the mid-1990s. After a temporary rebound in 1996 and 1997, housing price collapsed sharply in the wake of the Asian financial crisis in 19977. The house price increase in the early and mid-2000s seems to be caused by the expectations of profit from investment in real estate compared with the financial assets, as low interest rates continued to prevail. The many changes in the home sales price index from January 1986 to October 2011 account for 153.3% nationwide and 180.2% in Seoul area, the northern part(Gangbuk area) of which rose by 103.9%, and its southern part(Gangnam area) dramatically climbed by 266.2%.

Growth without Banks: Korean Housing Repo Contract”, p. 3
6 Underdevelopment of house financial market made ripple effect like US sub-prime mortgage crisis be restricted in 2008 financial crisis
Particularly, such increases can be clearly seen in apartment-type\(^8\) housing. A look into the changes in the apartment sales price index shows 314.5% nationwide and 369.3% in Seoul area, the northern part(Gangbuk area) of which rose by 237.5%, and its southern part(Gangnam area) dramatically climbed by 448.2%. These figures far exceed 202.4% nationwide and 200.7% in Seoul, the changes in consumer price index during the same period.

\(^8\) Types of houses are Apartments, Detached houses, Row houses(Sources: Kookmin Bank, 'Home Price Trends Survey').

\(^9\) An apartment is a five-story or more building(Sources: Kookmin Bank, 'Home Price Trends Survey').
Meanwhile, Park Chung-hee’s Government continually exercised strict control and supervision on the financial market to support export and foster particular industries, such as the heavy chemical industry. The survival of the private money market under the government’s various regulations on interest rate and financial repression targeting forced money allocation, or the policy loans for particular areas, was inevitable. The government’s regulations on the money market and concentration of policies on the corporate financial sector played a pivotal role in the existence and development of Jeonse, a non-institutional money market, in the household and home financial market. The reality is that the country’s money market was very incomplete compared with that of advanced countries, and the market’s loan-to-value ratio, a barometer showing the degree of limitations on liquidity, stood at about 20% to 40% in

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10 From 1962 to 1979.
11 Korean Economy Compilation Committee, 「The Korean Economy: Six Decades of Growth and Development」, Korea Development Institute(in Korean) Vol. 1 p.28, 2010,
An increase in demand for speculative money stemming from the expectation for house price increase and the non-existence of household and home loans in the institutional market that could accommodate this factor led to a particular system called Jeonse, a private money market, in the housing money market. That is, Jeonse is the key variable in linking house purchase, housing rental, and housing finance markets. Therefore, the three markets should be considered in analyzing the factors affecting Jeonse price. However, previous related studies are limited only to the house purchase market or housing rental market in the investigation of Jeonse price determinants.

Therefore, the present paper analyzed the reason Jeonse price theoretically has a different house purchase price even though both provide the same housing services, considering the actual Jeonse system characteristics in terms of house purchase, housing rental, and housing finance markets. The current paper also investigated whether the theoretical model coincides with the actual Korean situation.

[Figure 3] Factors Distinguishing Jeonse Price from House Purchase Price

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Estimation results indicate that, first, the expectations for house price increase is significant and opposite to the *Jeonse* price. Thus, the lower the expectations for house price increase is, the higher the *Jeonse* price, which tends to approach the house purchase price. Second, the mortgage loan interest-rates is also significant and positive in relation to *Jeonse* price. Finally, the results indicate that government regulation on the housing finance market is also a significant and negative influence.

The previously stated finding shows that the recent surge in *Jeonse* price, together with the decrease in *Jeonse* supply, is a natural phenomenon because expectations for house price increase has begun to stagnate, and an official housing financial sector has been developed in the past 15 years.

The current paper has four sections. In section 2, the theoretical model addressing the difference between the *Jeonse* price and house purchase price is presented. The factors affecting the difference between the *Jeonse* price and house purchase price are also introduced. The proposed estimation method and estimation results are presented in section 3. In section 4, the conclusion is presented.

**Chapter 2. Theoretical Model**

2. 1. Adequate *Jeonse* Price in House Purchase Market

The house is an important asset in determining the flow of housing service. Thus, two markets related to the house exist: the asset market ownership is transacted (house purchase market), and the housing rental market housing services are traded for a certain period\(^\text{13}\). That is, the house has two characteristics of consumer goods that provide domicile service and investment to obtain capital gain in the future. Therefore,

house purchase price consists of the "cost of housing services (house as consumer goods)" and "capital gain (house as investment)."\textsuperscript{14}

The demand for Jeonse is purely the demand for housing services, whereas the demand for house purchase is the demand including the capital gain and domicile service. Thus, no capital gain can be obtained from owning the house, so the house purchase price becomes the same as the Jeonse price. Equation (1), representing house purchase price ($P_t$), is equal to Jeonse price ($C_t$) if the housing market is perfectly effective and if the depreciation cost of the house and property tax is not considered.

$$P_t = C_t, \cdots (1)$$

However, as [Figure 4] the Jeonse/Purchase price ratio for Apartment, the most well-known house type in Korea indicated, practically house purchase price is much higher than Jeonse price.

The time series data also indicate that the house purchase price has been persistently higher than the Jeonse price.
The main reason for the price gap in the same contract to obtain the right of residence seems to be the expectation that home ownership is more profitable than home lending via Jeonse. Jeonse price, when compared to housing price in Seoul—where the opportunity of capital gain is great—has actually been consistently lower than the price in the whole country.

If the cost, such as tax or the maintenance fee, is not considered, the arbitrage condition between the house purchase price and Jeonse price can be presented as follows.

\[ P_i = C_i + E_i[a_{i,t}] \cdots (2) \]

\( P_i \) is the house purchase price, \( C_i \) is the Jeonse price, and \( E_i[a_{i,t}] \) represents the expectations for house price increase. Equation (2) indicates that the house purchase price consists of two parts: Jeonse price of the pure housing cost and capital gain.

Equation (2) can be rearranged to obtain

\[ C_i = (1 - E_i[a_{i,t}]) \cdot P_i \cdots (3) \]

Therefore, the adequate Jeonse price is determined as Equation (3) in the house purchase market. According to Equation (3), the lower the expectations for house price increase is, the larger the difference between the Jeonse price and house purchase price. As an extreme case, if the expectation for house price increase converges on zero, the Jeonse price would be equal to house purchase price.

2.2. Factors Affecting the Jeonse Price in the Housing Rental and Housing Finance Markets

Historically, housing rental contracts mainly consist of the Jeonse contract. However, since the 2000s, much of the Jeonse contract has been changed to quasi-
Jeonse (i.e., reducing the Jeonse deposit money and receiving monthly rent in return). Naturally, the ratio of Jeonse contract in the housing rental market started to decrease.

This change in the housing rental market is closely connected to the change in the housing finance market. The 1997 Korean financial crisis greatly affected many different fields. For example, financial companies indiscreetly lent money to companies before 1997 because they believed the government would act like a "final loaner." However, they took a big hit in the financial crisis, so they changed their marketing strategy to consumer finance focusing on housing mortgage loan. Their change in strategy resulted in the rapid increase of consumer finance loans.

[Figure 6] Ratio of Household Loans in Commercial Banks

Some researchers (e.g., Lee 2002) argued that Jeonse as private financing would disappear and all of the housing lending contracts would change to pure monthly rent contracts because of the recent vitalization of consumer finance and the decrease of the ratio of Jeonse contract in the housing rental market. This point of view regards Quasi-Jeonse as a transitional lending contract that occurs in the process in which Jeonse
changes to pure monthly rent. Without a doubt, the role of Jeonse, which has acted like informal housing finance, decreases because of the development of the formal housing finance market, except for the following issues: whether the development of Quasi-Jeonse is a transitional phenomenon that occurs in the process in which Jeonse changes to pure monthly rent, or whether the coexistence of Jeonse, Quasi-Jeonse, and pure monthly rent is the equilibrium of the housing rental market. As a result, the decrease in the ratio of the Jeonse contract in the housing rental market will necessarily affect Jeonse price. Thus, if we consider the effect of the decrease in Jeonse supply on Jeonse price, because of changes in the housing rental market and the housing finance market, we can obtain the equation below.

\[ C_I = (1 - E_t [a_{I,t}]) \cdot P_I + f (factors \rightarrow decrease - Jeonse - supply) \cdots (4) \]

Equation (4) explains that a decrease in Jeonse supply due to changed circumstances of the housing rental market and housing finance market acts as an inflationary pressure on rental charge, leading to the adjustment of adequate Jeonse prices partly determined by the arbitrage condition.

Then, what are the specific variables in the house rental and house financial markets influencing the supply of Jeonse? Before addressing this issue, we need to focus on the substantial purpose of the use of Jeonse security deposit first. Jeonse security deposit was used not so much as to create revenue accruing from money deposited in the bank but generally to use it as a means of financial leverage for housing purchase. Choi and Ji (2008) asserted that, as Jeonse security deposit could be used as a financial means of house purchase, mortgage loans in the institutional financial market should also be regarded the same. That is, Jeonse as non-institutional finance and mortgage as institutional mortgage loan should be considered substitutes for each other.

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If so, accessibility to the institutional loan market, and an increase and decrease in the burden of expenses incurred by using the institutional financial market will affect those in overall supply as non-institutional finance, which is a substitute for institutional loan. Cost for using the institutional money market can be represented as mortgage loan interest-rates and accessibility to the institutional money market as a regulatory policy on mortgage loan. The discussion will be extended. Considering the variables can cause a decrease in Jeonse supply in the aforementioned adequate Jeonse price under the arbitrage condition.

Therefore, equation (4) can be expressed as follows: (5)

\[ C_t = (1 - E_t[a_{t+1}]) \cdot P_t + f(r_t, \text{regulation}_t) \cdots (5) \]

At this time, \( r_t \) indicates the mortgage loan interest-rates on borrowing from institutional finance, and \( \text{regulation}_t \) denotes the government’s regulations on the institutional financial market.

This study began from the discussion that Jeonse price, that is, compensation for Jeonse contract that causes the same housing service, should be the same as house sale price. Moreover, it sought to determine the causes of existence of the persistent gap between Jeonse and sale price in the variables of the house purchase market, housing rental, and housing finance market. Equation (5) shows that, affected by the following variables, Jeonse prices may deviate from sale prices and create a gap:

Jeonse price \( C_t \) does not match House purchase price \( P_t \) because of

1. Expectation for house price increase \( E_t[a_{t+1}] \)
2. Mortgage loan interest-rates in the institutional housing finance market \( r_t \)
3. Government regulations on the institutional housing finance market \( \text{regulation}_t \)

Expectation for house price increase \( E_t[a_{t+1}] \) increases the capital gain on house in the house purchase market, making Jeonse price deviate from sale price. That is, the
more the capital gain is expected of house as investment goods, the farther the *Jeonse* price gets from the sale price, decreasing relatively.

As mortgage loan interest-rates \( r_i \) decreases, incentives to raising the capital with *Jeonse* as private banking, which is a substitute, *Jeonse* supply will decrease in the housing rental market. Such decrease in *Jeonse* supply will lead to an increase in *Jeonse* price.

Finally, the government can make it difficult or easy to be accessible to commercial banks by intervening in the formal housing finance market. If the government’s regulations \( \text{regulation}_t \) make it difficult to be accessible to commercial banks, the lessee has no choice but to use *Jeonse*, which is non-institutional finance. This phenomenon leads to an increase in *Jeonse* supply in the housing rental market. Therefore, the government’s tightened regulations will increase *Jeonse* supply and lower *Jeonse* price.

Next, in Section 3, to determine whether the theoretical model coincides with the real Korean situation, an estimation analysis will be performed and investigated.

### Chapter 3. Empirical Analysis

#### 3.1. Estimation Data

*Jeonse* price is affected by the variables from house purchase, housing rental, and housing finance markets, as I argued in the previous theoretical analysis section. Variables affecting the difference between *Jeonse* price and house purchase price are 1) expectation for house price increase \( E_{t}[a_{t+1}] \), 2) mortgage loan interest-rates in the formal financial market \( r_i \), and 3) government regulation on institutional house finance market \( \text{regulation}_t \).
Data on Jeonse price and house purchase price are based on the indexes of Jeonse price and house purchase price in the "Home Price Trends Survey" offered by Kookmin Bank. This index uses sales price when the sample house is transacted and the price derived by the "method of comparing sales(rental) example" when not transacted. The Laspeyres method was applied to reported price to make the index (base period is June 2011). Weights are the component ratio by region, type of house, and house inventory (details on the estimation equation are found in the Appendix). Indexes of Jeonse price and house purchase price are not the actual price. Prices of the base period (June 2011) are different by region, so the indexes of Jeonse price and house purchase price cannot be compared by region. However, the aim of this study is to analyze the trend of price by region, so I used the house price statistics by Kookmin Bank because it is considered more reliable than the statistics of actual sales price, which reflects only the price change of the purchased house. The natural logarithm of the indexes of Jeonse price and house purchase price were used as level variables.

Expectation for house price increase\( E_t\{a_{t+1}\} \) applied the adaptive expectations hypothesis and employed the average one year past house price increasing rate as proxy. Practically, that consumers in the housing market have predictive ability about the future is hard to say. Moreover, not many studies on expectation formation for participants in Korea housing market have been conducted. Based on the study of expectation formation for participants in the US house market (Hamilton and Schwab)

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16 An example of the method of comparing sales(rental) is the method of determining the price of real estate. After collecting many examples of transactions, the most similar case is chosen. If needed, the base period or the situation can be revised.
① Factor of region: similarity of location
② Individual factor: physical similarity
③ Revision of situation: if the price of the collected example of the transaction is inappropriate because of a specific situation of the dealer or individual motivation, the price is corrected to a normal one.
④ Revision of base period (similarity of time): if there is a price change between the time of purchasing real estate and the reported time, the price of the sample transaction is corrected to the price of the reported time.
17 The aim of statistics of house price in Kookmin bank is to estimate the variation of price of sample houses which represent all houses, but the aim of statistics of actual sales price is to estimate the variation of price of purchased houses. Thus, they are different statistics. (Source: Kookmin Bank 「Home Price Trends Survey」)
1985), expectation formation of economic agents depends on the trend of the past, not on a reasonable forecasting. Moreover, in the present paper, not only the average one year past house price increasing rate but also the average one year past house price increasing rate lagged on each first, second, and third year is considered independent variables, and they are analyzed together. The paper attempts to overcome the limitation of previous related studies that only applied the uniformly short-term average past house price increasing rate as the rising expectation rate portion, considering that although consumers’ expectation formation for the future relies on the past, a difference exists depending on the consumers.

Private sector mortgage loan interest-rates of the formal financial market ($r_f$) is represented as an average weighted by new loans extended during the period by nationwide commercial banks and collected at the central bank. The exact proxy of the private sector mortgage loan interest-rates of the formal house financial market is the interest rates of the mortgage loan for private, but it collected only from September 2001. The correlation between the interest rates of mortgage loan and the private lending rates from September 2001 to October 2011 is 0.9522, so using the private sector lending interest rates as proxy will not be a problem.

I used debt to income (DTI), which is the regulation for mortgage value and borrower’s capability to repay as proxy of the government’s regulation for the housing finance market. I used dummy variable, which is one since March 2006 when DTI was implemented in earnest and zero before March 2006.

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19 DTI = (monthly repayment of the principal and interest of loan + estimated repayment of interest of other loans) / monthly income
The objects of analysis are the apartments, which are the main housing type of Korea, and “overall houses,” which include apartments\(^{26}\), detached houses\(^ {21}\), and row houses\(^ {22}\). Regions of analysis are the entire country, Seoul\(^ {23}\), Gangnam in Seoul\(^ {24}\), and Gangbuk in Seoul\(^ {25}\), respectively. Period of analysis is from January 1996 to October 2011, for a total of 190 months.

3. 2. Estimation Method and Estimation Results

I took the logarithm of each variable based on Equation (5). The following shows the regression model:

\[
\ln C_t = \alpha + \beta_1 \ln P_t + \beta_2 \ln(1-a_1) + \beta_3 \ln(1-a_2),
\]

\[
+ \beta_4 \ln(1-a_3), + \beta_5 \ln r, + \beta_6 \text{(regulation)}, + \epsilon_t, \cdots (6)
\]

\(a\) represents the average one year past house price increasing rate, and \(a_1\), \(a_2\), and \(a_3\) represent that of lagged \(a\) at one, two, and three years, respectively.

The estimation method used is the ordinary least squares method. The present paper attempts to analyze the following. First, is there a difference between \(Jeonse\) price and house purchase price, which both provide exactly the same housing service (i.e.,

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20 An apartment is a five-story or more building (including the five-story or more dormitories.)
21 Detached houses include houses that are not apartments, row houses, multiplex houses, or dormitories. They also include houses with small shops inside and multiple dwellings.
22 Row houses include four-story or less buildings that have more than 660 m\(^2\) gross area. (including four-story or less dormitories.)
23 Capital city of Korea
24 Gangnam in Seoul includes 11 gu (an administrative district of Korea) south of the Han River, which are Gangnam-gu, Gangdong-gu, Gangseo-gu, Gwanak-gu, Guro-gu, Geumcheon-gu, Dongjak-gu, Seocho-gu, Songpa-gu, Yangcheon-gu, and Yeongdeungpo-gu.
$C_j = P_j$, or not? Second, if there is a difference between the two prices, is it possible to explain it using the variables from house purchase, housing rental, and housing finance markets. Therefore, I tested the null hypothesis $H_0: \beta_i = 1$ and $H_0: \beta_i = 0$ ($i = 2, \ldots, 7$). The estimation results on the entire country, Seoul, Gangnam in Seoul, and Gangbuk in Seoul are presented in [Table 1] and [Table 1-1].

[Table 1] Estimation Results of Overall Houses by Regional Groups for $H_0: \beta_i = 1$

<table>
<thead>
<tr>
<th>Classification</th>
<th>Whole Country</th>
<th>Seoul</th>
<th>Seoul, Gangnam</th>
<th>Seoul, Gangbuk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log(house purchasing price)</td>
<td>1.012</td>
<td>1.046</td>
<td>0.866**</td>
<td>1.100</td>
</tr>
<tr>
<td>coef/ p-value</td>
<td>(0.845)</td>
<td>(0.557)</td>
<td>(0.037)</td>
<td>(0.172)</td>
</tr>
</tbody>
</table>

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

The estimation results of the overall houses are presented in Table 1. Null hypothesis ($H_0$) is $\beta_i = 1$. The estimation results show that, generally, the null hypothesis, that is, the Jeonse price is equal to the house-purchasing price, cannot be rejected except for Gangnam in Seoul. Thus, this results show that Jeonse price is not different from the house purchase price. However, this is not the case in Gangnam in Seoul. Jeonse price is different from the house purchase price at a 5% significance level in Gangnam in Seoul. These estimation results are consistent with the fact that the increase in house price in Korea mainly occurred in Seoul, especially in Gangnam, the southern parts of Seoul. Jeonse price is different from the house purchase price in the region where people expect great capital gain.
### Table 1-1: Estimation Results of Overall Houses by Regional Groups

For $H_0: \beta_i = 0 (i = 2, 3, 4, 5, 6, 7)$

<table>
<thead>
<tr>
<th>Classification</th>
<th>Whole Country</th>
<th>Seoul</th>
<th>Seoul, Gangnam</th>
<th>Seoul, Gangbuk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coef/ p-value</td>
<td>coef/ p-value</td>
<td>coef/ p-value</td>
<td>coef/ p-value</td>
</tr>
<tr>
<td>log(1-a)</td>
<td>-1.526***</td>
<td>-1.034***</td>
<td>-1.194***</td>
<td>-0.427</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.004)</td>
<td>(0.000)</td>
<td>(0.393)</td>
</tr>
<tr>
<td>log(1-a1)</td>
<td>0.267</td>
<td>1.229***</td>
<td>0.778**</td>
<td>1.004**</td>
</tr>
<tr>
<td></td>
<td>(0.383)</td>
<td>(0.001)</td>
<td>(0.014)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>log(1-a2)</td>
<td>1.031**</td>
<td>2.571***</td>
<td>2.870***</td>
<td>4.563***</td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>log(1-a3)</td>
<td>3.488***</td>
<td>4.623***</td>
<td>3.672***</td>
<td>4.246***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>log(lending interest rate)</td>
<td>-0.092***</td>
<td>-0.084***</td>
<td>-0.075***</td>
<td>-0.138***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>regulation</td>
<td>-0.046***</td>
<td>-0.104***</td>
<td>-0.095***</td>
<td>-0.089***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
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<tr>
<td>Number of obs</td>
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<td>190</td>
<td>190</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.9725</td>
<td>0.9599</td>
<td>0.9715</td>
<td>0.9437</td>
</tr>
<tr>
<td>Root MSE</td>
<td>0.01546</td>
<td>0.02005</td>
<td>0.01786</td>
<td>0.02076</td>
</tr>
</tbody>
</table>

*note:*** $p<0.01$, ** $p<0.05$, * $p<0.1$

The average growth rate of house purchase price lagged one, two, and three years (i.e., $a_1$, $a_2$, and $a_3$, respectively) is significant to Jeonse price in Gangnam and Gangbuk of Seoul and Seoul (including Gangnam and Gangbuk). However, their effect on Jeonse price is relatively small in the entire country. These results emerged as only the average growth rate of house purchase price lagged two and three years ($a_2$, $a_3$) is significant in the entire country, and the coefficient is smaller than that in Gangnam and Gangbuk of Seoul and Seoul. This estimation covers the entire country; thus, it seems that the growth rate of house purchase price is not closely linked to the Jeonse price in small and medium-sized cities, except Seoul. Expectation for capital gain has been large
in Gangnam of Seoul. Based on the empirical theoretical argument, if there are expectations for capital gain, the gap between house purchase price and Jeonse price occurs through the house purchase market, and the supply of Jeonse increase through the house rental market. Finally, the Jeonse price decreases.

The interest-rates of private loan($r^i$) was significant and negative to Jeonse price at a 1% significance level in all regions. This finding supports the theoretical argument that, if the interest-rates of loan, which is the cost for using the formal financial market decreases, the preference of the lender for Jeonse, which is informal finance, decreases; thus, Jeonse price increases because of the decrease in Jeonse supply.

The regulation variable($t_{regulation}$) was also negatively significant at the 1% significance level, as predicted by theoretical analysis in all regions estimated. These estimation results are consistent with the fact that accessing the housing finance market is difficult because of DTI, supply of Jeonse, private housing finance, increases, and Jeonse price decreases. Here, the coefficient of Seoul is greater than that of the entire country. This finding is assumed because practical regulation is imposed intensively in Seoul, where house price has dramatically increased.

Conclusively, the variables were mostly significant to Jeonse price, as predicted by theoretical analysis. However, the coefficient of the house price increasing rate variables (i.e., $a1$, $a2$, and $a3$) was relatively higher compared with that of private lending interest-rates($r^i$) or regulation($t_{regulation}$) variables. We can assume that when the role of house as the inventory to take capital gain primary is emphasized, the incentives to raise funds are subsidized from the formal or informal financial market to obtain capital gain.

Next, the estimation results of apartments, which account for over 50% of Korean house types and have an overwhelming house price increasing rate compared with detached houses or row houses, are presented. The results analyzed by regional groups are given in [Table 2] and [Table 2-1].
Table 2] Estimation Results of Apartments by Regional Groups for $H_0: \beta_1 = 1$

<table>
<thead>
<tr>
<th>Classification</th>
<th>Whole Country</th>
<th>Seoul</th>
<th>Seoul, Gangnam</th>
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<tr>
<td></td>
<td>coef/ p-value</td>
<td>coef/ p-value</td>
<td>coef/ p-value</td>
<td>coef/ p-value</td>
</tr>
<tr>
<td>Log(house purchasing price)</td>
<td>0.820*** (0.000)</td>
<td>0.768** (0.018)</td>
<td>0.663*** (0.000)</td>
<td>0.898 (0.138)</td>
</tr>
</tbody>
</table>

Note: *** p<0.01, ** p<0.05, * p<0.1

Estimation results when the house is restricted to apartments are presented in Table 2. Null hypothesis is $H_0: \beta_1 = 1$. This result is very different from that for overall houses (including apartments, detached houses, and row houses). Estimation result shows that Jeonse price was different from house purchase price at a 1% significance level in Gangnam of Seoul (5% significance level for overall houses). An important difference for apartments is that Jeonse price was different from the house purchase price at 1% and 5% significance level in the entire country and Seoul, respectively. Similarly, the Jeonse price was low in the region (i.e., Gangnam of Seoul) where people have great expectation for capital gain (Table 1). The main reason why the Jeonse price of apartments deviated much from the house purchasing price is that the capital gain of apartments was much greater than that of detached houses and row houses.
<table>
<thead>
<tr>
<th>Classification</th>
<th>Whole Country</th>
<th>Seoul</th>
<th>Seoul, Gangnam</th>
<th>Seoul, Gangbuk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>log(1-a)</strong></td>
<td>-1.297***</td>
<td>-1.242***</td>
<td>-1.291***</td>
<td>-1.134***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.003)</td>
</tr>
<tr>
<td><strong>log(1-a1)</strong></td>
<td>0.339***</td>
<td>0.964***</td>
<td>0.667**</td>
<td>1.264***</td>
</tr>
<tr>
<td></td>
<td>(-0.108)</td>
<td>(0.001)</td>
<td>(0.013)</td>
<td>(0.000)</td>
</tr>
<tr>
<td><strong>log(1-a2)</strong></td>
<td>3.066***</td>
<td>3.279***</td>
<td>2.630***</td>
<td>3.526***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td><strong>log(1-a3)</strong></td>
<td>2.682***</td>
<td>3.509***</td>
<td>3.267***</td>
<td>2.880***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td><strong>log(lending interest rate)</strong></td>
<td>-0.136***</td>
<td>-0.133***</td>
<td>-0.129***</td>
<td>-0.148***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td><strong>regulation</strong></td>
<td>-0.042***</td>
<td>-0.080***</td>
<td>-0.068***</td>
<td>-0.071***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Number of obs</td>
<td>190</td>
<td>190</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.9725</td>
<td>0.9599</td>
<td>0.9715</td>
<td>0.9437</td>
</tr>
<tr>
<td>Root MSE</td>
<td>0.01546</td>
<td>0.02005</td>
<td>0.01786</td>
<td>0.02076</td>
</tr>
</tbody>
</table>

*note: *** p<0.01, ** p<0.05, * p<0.1*

The average growth rate of house purchase price lagged one, two, and three years (i.e., $a_1$, $a_2$, and $a_3$) was more significant in apartments than in overall houses. The average growth rate of house purchasing price lagged one year ($a_1$) was not significant in overall houses but was significant at the 1% level in Seoul and entire country for apartments. This finding may be caused by the fact that apartments have been used as a means of obtaining capital gain than overall houses, which include detached houses and row houses. Thus, this expectation for capital gain affects the relative decrease in Jeonse price in apartments.
The interest-rates of private loan ($r_t$) was significant and negative to Jeonse price at the 1% level in all regions in overall houses. However, the coefficient was generally increased in overall houses. The reason is that the interest-rates of private loan as cost for the formal financial market becomes more important, as apartments serve as investment goods to obtain capital gain than overall houses.

The regulation variable ($\text{regulation}_t$) is not much different from the case of overall houses. It was also negatively significant at the 1% significance level, as predicted by theoretical analysis in all regions estimated. These estimation results are consistent with the fact that accessing the housing finance market is difficult because of DTI, supply of Jeonse, private housing finance, increases, and Jeonse price decreases, as well.

Variables are mostly significant to Jeonse price, as predicted by theoretical analysis, in the case of apartments as well. However, the results for apartments show that Jeonse price is different from sales price, the explanation power of the house price increasing rate variables (i.e., $a_1, a_2, \text{ and } a_3$) have improved, and the coefficient value of private lending interest-rates ($r_t$) is higher compared with the case of overall houses. Considering the region expected to obtain more capital gain compared with other regions (Seoul Gangnam) and the probability type expected to have more capital gain compared with other types of houses (apartments), the incentives to invest in houses are likely to increase by raising funds. In this case, Jeonse price has a gap with the house purchase price, improving the explanation power of the variables (i.e., $a_1, a_2, a_3, r_t$, and $\text{regulation}_t$). Moreover, the most important factor marking the difference between Jeonse price and house purchase price is the expectation for house price increase.

Chapter 4. Conclusion

Knowing the Jeonse system is very important to gain an in-depth understanding of the Korean housing market. The Korean Government is trying to stabilize the Jeonse price to improve housing security for the Korean people. Furthermore, a recent, sharp
rise in Jeonse price had a strong influence on people, such that the press reports this issue every day. Despite this situation, there has been very little research focusing on the Jeonse price, even though there are research about how the housing price is determined, how much housing price affects Jeonse price, or vice versa.

The present paper analyzed the reason why Jeonse price has theoretically a different house purchase price, in consideration of the actual Jeonse system characteristics with respect to house purchase, housing rental, and housing finance markets. It also investigated whether the theoretical model coincides with the real Korean situation.

The current work started from house purchase market. It began with addressing the issue of why Jeonse price is different from house purchase price, even though both provide the same housing services (same location, same physical space). Practically, Jeonse price is lower than the general house purchase cost in the most regions of Korea.

First, this study obtained the reason that Jeonse price is lower than the house purchase price due to the expectation for house price increase. Houses are used not only as consumer goods that provide domicile service but also as investment to obtain capital gain in the future. Empirical results indicated that the Jeonse price is more likely to have a gap with house purchase price in region Gangam of Seoul expected to obtain more capital gain compared with other regions, and in apartment house type expected to have more capital gain compared with other types of houses. Also, the explanation power of the house price increasing rate variables (i.e., $a_1, a_2, a_3$) have improved in this region and this type. Moreover, the most important factor marking the difference between Jeonse price and house purchase price is the expectation for house price increase because coefficient value of house price increasing rate is higher than those of other variables.

Second, the study focused on the role of Jeonse in the housing rental and housing finance markets. Jeonse not only functions as a house-rental contract service but also plays an important role as a curbed private loan market in the absence of an official
private banking sector. From 1990s, however, as institutional money market open to private sector, the decrease in the ratio of the Jeonse contract in the housing rental market affect to increase Jeonse price. This was shown that interest-rates of private loan and regulations on the housing financial market variables was significant and negative.

Conclusively, if there are stable housing market traded only housing services and no excessive capital gain from house ownership and it is easier to assess the institutional house finance market, Jeonse price will approach house purchase price as well as ratio of Jeonse contract in the housing rental market will decrease. Therefore, the recent surge in Jeonse price, together with the decrease in Jeonse supply, is a natural phenomenon because expectation for house price increase has been stagnate, and an institutional housing financial sector has been developed in the past 15 years.
Appendix:

Estimation Equation about

Indexes of *Jeonse* price and

House purchasing price

Sources: Kookmin Bank 「Home Price Trends Survey」

1. Index of i-house type in h region : $\hat{G}_{ih}$

$$\hat{G}_{ih} = \frac{\sum_{j=1}^{n_{h}} W_{ih} \hat{G}_{ij}}{\sum_{j=1}^{n_{h}} W_{ih}}, \text{ where } d_{hi} = \sum_{j=1}^{n_{h}} W_{ih} d_{hij}$$

2. Overall index in h region : $\hat{G}_{h}$

$$\hat{G}_{h} = \frac{\sum_{i=1}^{3} \sum_{j=1}^{n_{h}} W_{ih} \hat{G}_{ij}}{\sum_{i=1}^{3} \sum_{j=1}^{n_{h}} W_{ih}}, \text{ where } d_{hi} = \sum_{j=1}^{n_{h}} d_{hij}$$

3. Overall index of i-house type : $\hat{G}_{i}$

$$\hat{G}_{i} = \sum_{h=1}^{H} W_{ih} \hat{G}_{ih}$$

4. Overall index in the whole country : $\hat{G}$

$$\hat{G} = \frac{\sum_{i=1}^{3} \sum_{h=1}^{H} W_{ih} \hat{G}_{ih}}{\sum_{i=1}^{3} \sum_{h=1}^{H} W_{ih}}$$

h : region (gu or city)

i : type of house (i=1,2,3)

j : individual sample house

θ : Indexes of House purchase price

$y_t$ : Indexes of house purchase price(*Jeonse* price) at t

$y_0$ : Indexes of house purchase price(*Jeonse* price) at base period

$r = \frac{y_t}{y_0}$ : ratio of house price at t

W : weight using ratio of house stock

d : weight using probability of selection

$n_{hi}$ : sample size of i-house type in h region

$N_{hi}$ : population size of i-house type in h region
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