Analysis of Rent Prices of Rental Housing by Year of Construction

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Outline

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- 4. Analysis of the Adjusted Rent Prices by Years of Construction
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1. Introduction

- 1-1 The purpose of this analysis
  - is to comprehend how the years of construction of the rented dwellings supplied in the rental market in Japan relate to the contract rent levels and how the relationship changes between the times of observations
  - ultimate goal is to obtain the fundamental data for improving the measuring precision of CPI
  - it will be very valuable to acquire profound knowledge of the factors behind the pricing and price changes of rent when working on the specific plan for the precision improvement

1. Introduction

- 1-2 Features of rented dwellings
  - The housing service of rented dwellings is one of the services that households consume
  - rented dwellings have two features
    - a unique product in the sense that exactly the same product regarding aspects such as quality and location does not exist
    - used for a long period with possible changes of tenant
  - these features must be taken into consideration when measuring the rent of rented dwellings in CPI

1. Introduction

- 1-3 Factors behind the pricing of rent
  - The rent prices seem to depend on the quality and the location of the dwelling, the supply-demand situation of the housing units, and the economic condition
  - supply-demand situation factor
    - change and migration of the national or regional population
    - supply quantity of new dwellings
    - turnover rate of existing dwellings
  - economic condition factor
    - (direct influence) movement of land prices
    - (indirect influence) movement of overall price level

1. Introduction

1-4 Viewpoint

- it is commonly known that the cross-sectional rent level varies depending on its construction year
- since dwellings have a feature of being a unique product used for a long period, the relative rent level difference correlated to the year of construction of dwellings and its change are important factors
- this analysis focuses especially on the year of construction of the rental dwellings

1. Introduction

- 1-5 Outline of this analysis
  - Used data: the individual data derived from the "Housing and Land Survey" conducted by the Statistics Bureau of Japan (SBJ)
  - estimate detailed rent functions taking the correlation between the characteristics of rental dwellings and their rent
  - attempt a cross-sectional and longitudinal comparison between the rent prices which we compute by years of construction while using the estimated rent functions to adjust the variance of the characteristics of dwellings

2. Summary of the Data

- 2-1 Summary of the Housing and Land Survey
  - one of the largest household surveys concerning housing both owned and rented
  - has been conducted every 5 years since 1948
  - sample size: about 3.5 – 3.6 million dwellings / households in about 210,000 enumeration unit districts
  - Questionnaires are completed by the household (some parts are by the enumerator by interviewing the household or investigating the exterior of the dwelling)

2. Summary of the Data

2-2 Used data scope

- Survey year: 2003, 2008, 2013
- Type of dwelling: Rented houses owned privately (used exclusively for living)
- Region: “Tokyo-to” (Tokyo Metropolis)
- Construction material and type of building: Non-wooden apartments, Wooden apartments, and Wooden detached houses
- Year of last move: the conducted year of the survey or the previous year
- Year of construction: 1961 and after

3. Estimation of Rent Function

3-1 Estimation of the rent functions

- Regressand: log(Rent / Area of Floor Space)
- Regressors:
  - Area of Floor Space
  - Year of Construction
  - Municipality
  - Distance to the Nearest Railroad Station
  - Stories of Building
  - Type of Kitchen
  - Construction Material

    and so on (rejected by low significance)
- Estimate separately by
  - the Survey year
  - the groups of non-wooden apartments, wooden apartments, and wooden detached houses

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3. Estimation of Rent Function

3-2 Analysis of Estimated Rent Functions

- Adjusted R^2: 0.54 -- 0.73
- Floor area and the locational characteristics (municipality, distance to the nearest railroad station) are significant
  => proxy (likely) for the land price, supply-demand situation
- the external structural characteristics (stories of building, type of kitchen) are significant
  => thought to be related to the quality of residential building
- the rent price level drops as the year of construction is traced retrospectively from 1996 – 2000
- rent level difference by years of construction tends to reduce as the Survey year goes forward
  =>possible effect that the dwellings of lower quality in the old rental units are eliminated from the market earlier

4. Analysis of the Adjusted Rent Prices by Years of Construction

4-1 Estimation of the Adjusted Rent Prices

- Using the estimated rent, we adjust the variance of the characteristics of the raw rent data and calculate the adjusted rent prices
- This adjustment has two meanings
  - adjustment of the cross-sectional variance caused by the individual samples
  - adjustment of the longitudinal variation caused by the whole samples
- Adjusted rent prices show the rent slope in cross-section data and its longitudinal change without the effect of scale, location and the external structural characteristics

4. Analysis of the Adjusted Rent Prices by Years of Construction

- 4-2 Analysis from Cross-sectional Perspective
  - In the group of non-wooden apartments in 2003/2013 Surveys, the rent level of existing dwellings built within about 10 years is higher than that of the new dwellings

  => possible reasons:
    - the new dwellings that were constructed for being owner-occupied and are superior to the dwellings intended for rent from construction in quality have been partly diverted into the use for rent
    - the new dwellings are affected by the supply-demand situation and the economic condition of the times more severely than the existing dwellings

4. Analysis of the Adjusted Rent Prices by Years of Construction

◻ 4-3 Analysis from Longitudinal Perspective

Period	Rent Level Change		Interpretation
	New Dwellings	Existing Dwellings	
2003 | 2008	Upward	Downward	In such a situation that the demand/ supply balance of new and existing dwellings influences mutually, the rent of existing ones might be pushed downward by new ones
2008 | 2013	fall significantly		When the prices fall, the rates of rent decrease of new and existing dwellings might vary inconsiderably

4. Analysis of the Adjusted Rent Prices by Years of Construction

4-3 Analysis from Longitudinal Perspective (Continued)

This analysis of possible factors stated above is rather hypothetical

=>

- we have to substantiate them by proof from other information sources
- we should also analyze the predominating rental dwellings which are under a contract that has been renewed more than once

5. Conclusion

5-1 Suggestions(1)

Points to be taken into account in studying the plans of improving the measuring precision of CPI

- the location conditions (municipality, distance to the nearest railroad station) are important determinants of rent level, so the sampling should be executed without the regional bias in the survey design
- dwelling scale (floor space), the external structural characteristics of dwellings (stories of the building, type of kitchen) also affect the rent level, so it is preferable that they are taken into consideration if the information about them is available

5. Conclusion

- 5-2 Suggestions(2)
  - the relative rent level of new dwellings to the whole rental dwellings may become higher in a situation where prices are rising, so we think the point should be taken into consideration in the survey design
  - as for CPI in Japan at the present time, the reporters consist of various combinations of dwellings and their tenants such as
    - new tenants of new dwellings,
    - new tenants of existing dwellings, and
    - tenants that have renewed the rental contract more than once,

    so we think we should monitor and manage the change of the reporters properly

5. Conclusion

- 5-3 Considerations
  - rent level differences between the years of construction in our estimation contain 4 factors;
    - effect of inflation
    - effect of depreciation
    - sampling bias
    - estimation bias of the rent function
  - the effect of depreciation cannot be separated from the effect of inflation without some kind of suppositions or further external information
  - we can hardly figure out the proper supposition
  - it is necessary to seek the external information that complements the analysis

5. Conclusion

5-4 Future Works

- the analysis using the individual data derived from the Housing and Land Survey should be expanded to the scope of tenants that have renewed the rental contract more than once or regions other than Tokyo-to
- in order to grasp the actual situations about the quality assessment of the rental housing units and the rent price formation process, it is essential to study the information collected directly from suppliers of the rental dwellings or of rental housing services and relevant organs

Thank you for listening.

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