City-Level Real Estate Price Indices for Japan, 1975 – 2015

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1 Overview

The data files described in this note contain annual city-level commercial and residential property price indices for Japan, covering the period from 1975 to 2015, which includes the 1980s Japanese Asset Price Cycle. As I describe in the details below, due to data limitations and thin property markets in some localities, the dataset does not cover all 1,741 modern municipalities as defined by 2015 Census municipal code numbers.

When using the dataset, please cite:

LaPoint, C. (2021): "You Only Lend Twice: Corporate Borrowing and Land Values in Real Estate Cycles," SSRN Working Paper, No. 3633606.

This is a beta version of the price indices, and I would welcome any feedback. I will update the dataset with local land use constraint measures and a more complete set of price indexing methods as the manuscript reaches the publication stage. Please do not hesitate to contact me with questions or if you would like to share any output you produce using these price indices.

The indices for residential property values are also the source of housing market shocks to households constructed in:

LaPoint, C. & T. Unayama (2021): "Winners, Losers, and Near-Rationality: Heterogeneity in the MPC out of a Large Stimulus Tax Rebate," SSRN Working Paper, No. 3677483.

2 Dictionary

The following is a list of definitions for all variables in the dataset. Each variable is defined in the same way across the two data files.

- **city_code**: The Census city code which defines a real estate market according to 2015 municipal boundaries.
- **city_name**: The jurisdictional name as of 2015 which is attached to **city_code**.
- **year**: Calendar year in which property valuations occurred.

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- **cre_ind**: Commercial real estate (CRE) price index level in **city_code** and **year**.
- **res_ind**: Residential real estate price index level in **city_code**.
- **pref_name**: The prefecture containing **city_name**. A prefecture is equivalent to a U.S. state.
- **pref_code**: The Census code number associated with **pref_name**. There are 47 prefectures in total, so this code varies from 1 to 47.
- **designated**: A 0/1 flag for whether **city_name** has attained a population of at least 500,000. This is an official Cabinet Office designation.
- **core**: A 0/1 flag for whether **city_name** has attained a population of at least 200,000 and measures at least 100 square kilometers. This is an official Cabinet Office designation. The flag is set to 0 if the **designated** flag is set to 1.
- **tot_pop_YYYY**: Total population residing in **city_code** in quinquennial Census year = YYYY, with YYYY ranging from 1975 to 2015.

3 Details

- A "city" in this dataset is defined by a distinct 2015 Census municipal code, which captures modern jurisdictional boundaries. Imposing modern geography definitions accounts for the large number of municipal mergers in Japan – from 3,278 distinct municipalities in 1980 to 1,741 in 2015 – in recent decades due to depopulation of the countryside. Please see the geographic crosswalk provided by RIETI for further information:

  Kondo, K. (2019): "Municipality-level Panel Data and Municipal Mergers in Japan," RIETI Data Management Project, https://www.rieti.go.jp/en/publications/summary/19030013.html

- Tokyo is divided into 23 distinct "wards" (*ku*) each of which have their own public administration. I provide a Tokyo-wide index (**city_code** = 13100) which pools price observations from all 23 wards, as well as ward-specific indices (13101 $\leq$ **city_code** $\leq$ 13123).
- Properties are sorted into commercial and residential categories based on the use of the property as of the appraisal survey year. As described in Section 3 of the paper, use is distinct from zoning. Commercial and industrial use properties are included in a single "non-residential" category which forms the estimation sample for the index values **cre_ind**.
- There are two data files which cover different sets of municipalities. The data file labeled "CPZ," restricts to properties in each city which are located in the city planning zone [CPZ] and adjacent to a road. The file labeled "FULL" does not impose these restrictions. Properties outside the city planning zone do not face regulations governing land use (e.g. factory vs. apartment building permitted), and are generally located on the outskirts of a municipal boundary. For smaller cities in the "FULL" data file, properties are more likely to be mixed use, and so distinctions between residential and non-residential property become less clear.
- The main empirical results in the manuscript are obtained using the CPZ file of price indices, which contains a smaller subset of cities. The land use regulatory measures presented in Section 3 of the paper also only pertain to CPZ properties.

- I restrict the index estimation to cities which have at least 30 property valuations in a given year. This restriction results in the bottom 80% of municipalities by 1980 Census population dropping out of the sample. For the CPZ file, I impose this restriction after subsetting to CPZ properties, which results in a smaller number of cities ($N = 299$) compared to the FULL file ($N = 402$). The samples include cities which would correspond to at least the size of a micropolitan statistical area in the U.S. (population > 10,000).

- I then drop all plots with a greater than 5% annual change in recorded plot size. This restriction removes subdivided properties, and results in dropping less than 0.1% of the sample after applying the above restriction.

- The correlation between the sets of price indices based on balanced vs. unbalanced panels of parcels is 99%. I therefore have not dropped any parcels which enter/exit during the sample period to maximize geographic coverage and precision of the price level estimates.

- The main reason why the dataset is an unbalanced panel is due to cases in which cities grow in population to such an extent that the Cabinet Office gives them a new official designation, which alters their administrative responsibilities to a region. In re-designation years, annual price growth cannot be measured because the Ministry of Land, Infrastructure, Transport, and Tourism (MLIT) reshuffles the set of properties included in the appraisal sample. A notable example of this is Chiba (**city_code** = 12100) attaining **designated** city status in 1991.

- All index series are normalized to 1 in base year 1975. In the paper, I use 2000 as the base year for the corporate real estate asset book-to-market conversions, as the historical CPI and wholesale price index series also have 2000 as a base year. See Appendix F for details on the book-to-market conversions. The main results, which are based on city-level variation, are insensitive to the choice of a base year common to all locations.

- The indices are constructed using a "repeat appraisal" method, which exploits the fact that properties in the sampling frame are appraised each year until the use of the property changes. Therefore, unlike standard repeat sales, the quality adjustment entails no selection into the estimation sample on the basis of whether the property sells at least twice. A complete description of the underlying property value records and index construction method are provided in Section 2 and Appendix A of the paper.

- Appendix A in the paper compares the price indices from the repeat appraisal method to repeat sales indices estimated for more recent transactions data (Appendix A.2) and to other indexing methods (Appendix A.3).

- Appendix A.1 discusses differences between commonly cited aggregate price indices for Japan and indices resulting from my indexing methods. Appendix A.4 compares prefecture-level indices using the repeat appraisal method to prefecture-level land value indices obtained from the National Accounts.

- Appendix A.5 in the paper describes sampling and appraisal procedures underlying the indices. The valuation criteria most closely correspond to the principle of "highest and best use" governing IRS real property valuations in the U.S., which means building characteristics are incorporated into the valuation.

- Census population statistics downloaded from the Cabinet Office MIERUKA database, available here (Japanese only): http://wwwb.cao.go.jp/ittaikaikaku/mieruka/. Population totals reflect totals across all municipalities within the same modern **city_code**.