Handbook on Residential Property Price Indices

(sponsored by Eurostat & endorsed by Inter-Secretariat Working Party on Price Indices)

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Handbook on Residential Property Price Indices – purpose & overview

- Guidance on concepts & methods
- But practical recommendations (not rules) on compilation take into account different country situations
  - Most particularly data availability.
- Aim: fit-for-purpose indices & increased international comparability
- Structure
  - Chapter 1 Introduction
  - Chapter 2 Reviews uses (macro-economic indicator; wealth component; financial stability indicator; National Accounts deflator; input into CPI)
  - Chapter 3 Conceptual Framework – different uses, different concepts.
  - Chapters 4-7 In-depth review of main compilation methods (mix-adjustment; hedonic regression; repeat sales)
  - Chapter 8 Decomposition into land/building
  - Chapter 9 Qualitatively examination of different data sources
  - Chapter 10 Catalogues availability of RPPIs (up-to-date metadata on BIS website)
  - Chapter 11 Provides practical guidance with illustrative data-sets
  - Chapter 12 Recommendations
Chapter 12: Recommendations & Guidelines – weighting

• Type of index to be compiled, will depend on its purpose.
  • *System of National Accounts (1993/2008).*

• A *stock-weighted* index is appropriate when measuring the *wealth* associated with the ownership of residential property
  – A *stock-weighted* index is also appropriate for a financial stability indicator, in particular to identify property price bubbles.

• A *sales-weighted* index is appropriate for measuring the *real output* of the residential real estate industry
  – This is consistent in treatment to the acquisition or purchase of goods and services in a consumer price index.
Chapter 12: Recommendations and Guidelines – scope

• A price index covering all residential property is appropriate for measuring the wealth associated with the ownership of residential property
  – The index should cover existing properties and properties which have been recently built
  – It should include conversions of existing property, for example where a warehouse has been converted into flats or an existing property has been sub-divided.

• An index covering all properties is also appropriate when used as a financial stability indicator
Chapter 12: Recommendations and Guidelines - scope

• A price index covering new property only is appropriate for measuring the real output of the residential real estate industry

• The value of new housing is part of gross investment
  – The cost of the land, apart from the value of any improvements made to this element, should be excluded

• A price index restricted to new property is also appropriate for the inclusion of owner-occupier housing costs on a net-acquisition cost basis
  – I.e. where the consumer price index covers the cost of acquiring properties which are new to the owner-occupier housing market
Chapter 12: Recommendations and Guidelines – constant quality

- A residential property price index compares the values of the stock or of the sales of residential property between two time periods
  - after allowing for changes in the attributes of the properties involved
  - Price changes need to be decomposed into those associated with changes in attributes and the residual which relates to the underlying “pure price” change

- A constant quality price index is appropriate for all purposes
  - Both for a stock and for a sales-weighted price index

- Challenging but a number of practical methodologies which can be used
Chapter 12: Recommendations and Guidelines - decomposition between building & land components

• A decomposition between building & the land.
  – should be made where a country’s balance sheet estimates of national wealth make this distinction
  – may also be required when a residential property price index is an input into the CPI for the measurement of owner-occupier housing costs using the net-acquisition approach

• Land decomposition & constant quality most challenging practical aspect.
Chapter 12: Recommendations and Guidelines - Statistical methods for compiling constant quality indices

• Challenging due to following three factors
  – Residential properties are heterogeneous
    • No two properties are identical
  – Prices are often negotiated
    • The (asking) price of a property is not fixed & can change throughout the transaction process until the price is finalised
    • A property's market value can only be known with certainty after it has been sold
  – Property sales are infrequent
  – For example, typically less than ten per cent of housing stock changes hands every year
  – A given house is likely to have a confirmed value not more than every ten years

• Four methodologies presented in depth in handbook
  – Stratification or “mix-adjustment”; hedonic regression; repeat sales; appraisal-based methods (more particularly, the SPAR method)
Chapter 12: Recommendations and Guidelines - Statistical methods for compiling constant quality indices: hedonics generally preferred

• Recommendation
  – Hedonic regression is generally the best technique for constructing a constant quality residential property price index
  – Hedonic regression using the predicted prices (not time dummy) approach is the recommended method
  – It is also recommended that stratified hedonic indices be computed to minimise the potential for any residual bias
    • Subject to the required data being available
Chapter 12: Recommendations and Guidelines - Statistical methods for compiling constant quality indices (hedonics)

• **Main advantages** of hedonics are
  – The method adjusts for both sample mix changes and quality changes over time of the individual houses
    - If the list of property characteristics is sufficiently detailed
  – Price indices can be constructed for different types of dwellings and locations through stratification and the application of hedonics to each individual stratum
  – The method maximises the use of the available data
  – It can be used to decompose the overall price index into the land and structures components, subject to the availability of data

• **Main disadvantage** – data intensive
Chapter 12: Recommendations and Guidelines – other statistical methods for compiling constant quality indices: mix-adjustment/stratification

- **Stratification or “mix-adjustment”**
  - Most straightforward method for controlling for changes in the composition or ‘quality mix’ of properties sold
  - Also addresses any user need for sub-indices relating to different housing market segments (house-type/location)

- **Main advantages**
  - It is not data intensive (but needs house characteristics)
  - It is easy to deploy & reproducible
  - It is not subject to revision

- **The main disadvantages**
  - It cannot deal adequately with depreciation or major renovations
Chapter 12: Recommendations and Guidelines – other statistical methods for compiling constant quality indices: stratification/mix-adjustment

- Recommendation
- Stratification or “mix-adjustment” is an appropriate method where
  - An appropriate level of detail is chosen for the number of cells and can be applied in practice.
  - The age of the structure is one of the stratification variables.
  - A decomposition of the index into structure and land components is not required
- *Stratification/mix-adjustment is recommended where the volume of sales is large enough to support a detailed classification of properties*
Repeat sales

- Observes the price development of a specific house over a period of time by reference to the selling price each time it is sold
- The price development of a “representative” selection of houses during overlapping time periods can then be used to measure general trend in prices
  - Using repeat sales on the same properties ensures a like for like comparison

The main disadvantages

- It uses information only on those properties that have sold more than once during the sample period
  - Small sample & selection bias from restriction to properties that have been sold more than once during the sample period
  - It ignores (net) depreciation of the dwelling unit
  - Cannot structure from land
Chapter 12: Recommendations and Guidelines – other statistical methods for compiling constant quality indices: repeat sales

• Recommendation
  – Repeat sales method is not preferred above the hedonic method but is satisfactory where
    • There is limited or no information on housing characteristics
    • There are a relatively large number of repeat transactions
      – To provide enough data points to populate the required types of residences and where sample selection bias is not a problem
  – Repeat sales method is not recommended when distinction needed between price of structure & price of land
Chapter 12: Recommendations and Guidelines – Other statistical methods for compiling constant quality indices: appraisal-based methods SPAR INDEX

- The value-weighted arithmetic Sale Price Appraisal Ratio (or SPAR) index
  - Re-scales appraisal-based indices by dividing by the base-period values
  - Corrects for the potential bias which may result from inaccurate valuations
  - Bias can arise from frequent re-assessments and reduced precision over time can arise from new appraisals

- The main advantages
  - It is consistent with index number theory & straight forward to compute
    - Being based on standard matched model methodology
  - Can benefit from many more observations than the repeat sales method
    - In which case less susceptible to problems arising from small number of price observations
  - It is not susceptible to sample selection bias

- The main disadvantages
  - It cannot deal with major repairs or renovations (or depreciation) of the dwelling units lack of data to decompose land from building
Chapter 12: Recommendations and Guidelines - Statistical methods for compiling constant quality indices (SPAR method)

- Recommendation
- Preferred to the repeat sales methodology
  - if assessment data of sufficient quality is available
- The SPAR methodology addresses some of the weaknesses of the repeat sales methodology
  - E.g. Selection bias
- The SPAR methodology does have its drawbacks but is a recommended when hedonics is not possible, in particular in combination with stratification
Handbook on Residential Property Price Indices

Concepts, definitions & target index is prescriptive
Guidelines on methods of practical compilation – depend on data availability


Meta-data on residential property price indices published by different countries is available from the website of the Bank for International Settlements (see [www.bis.org/statistics](http://www.bis.org/statistics))

End of Presentation