UNSC 2010, Lunchtime seminar:
Measuring Property Prices
Seminar in memory of Svein Longva
(former Director General of Statistics Norway)

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Overview of the family of property price indices and their importance

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1. Introduction

In this overview we discuss statistics on dwellings that is residential properties. Commercial buildings etc. are not included. The focus is on price statistics but also other aspects are mentioned. The overview includes both new and old houses. Typical for the housing market is that some people live as tenants (rental segment) and some people live in dwellings that are owned (Owner occupied houses). A challenge for the statistician is that houses (even with some standardisation) are unique with many quality differences – including location. Land is for some part an important element of value but the data distinction between land and building value may be vague. The yearly turnover is very limited for used houses compared to the total stock of houses. In addition to market/transaction prices we may observe assessment prices. In addition to the price that the seller receives taxes and fees to the agent and the authorities may be paid. Houses and dwellings are costly compared to yearly revenues for household and loans etc are important.

Houses and dwellings are a typical example of a durable consumer good, even if they also serve as investment and saving vehicles. Thus, a house is a bundled good of consumption and investment, and this leads to a clear distinction between the price of the house and the price for the service delivered to the household. How to measure these services is one of the major challenges.

2. Economic statistics and national accounts.

In many economies it may be a major political objective to improve housing standards. Implementation of intensive housing programs is important. These programs will be dependent of access to real resources (building materials) manpower and financial services necessary for the building of dwellings. This was also the case in Norway for the first part of the period after 1945 (end of Second World War).

The dwellings are assumed to produce services to the household – both rented and owner occupied. This household production of services has always been included in the Norwegian National Accounts. The method used was originally based on user cost perspective based on an estimation of assets in OOH. Today the imputation of dwelling services follow the rental equivalent method based on observed rents. The deflator for these services is identical to the corresponding CPI.

One major obstacle with the user cost concept is that it includes a component, capital loss that may change equity, and thus be classified investment /saving. Moreover, the capital loss, i.e. the purchase price minus the sales price, may turn negative and entail negative user costs. Ex ante negative user cost imply infinite demand, and the status in economic theory is unclear

Construction industry is a part of NA (includes both dwellings and commercial buildings) the industrial classification gives activity (or process detail) but do not include a distinction between commercial buildings and dwellings. Price data are available through two kinds of sources:
(i) Input price indices relating to costs by type of construction activity

This index is relevant for the costs in each kind of construction work - in fact by NA products in construction. Such indices are however problematic for use in the NA as they do not reflect changes in profits and productivity. This problem may turn out to be even more serious in a business cycle affected industry like construction.

(ii) Output price index (Hedonic) for new dwellings (but no other part of construction)

Relevant for actual price development in one of the four categories of dwellings, i.e. detached houses, row houses etc. (the three other dwelling categories are multi-dwelling houses, own-account dwellings and holiday houses). This price index for new dwellings relates to purchasers' prices. Hence, this index incorporates changes in profits and productivity.

The main methodology used is to combine these two sources, as source (i) is product-oriented and source (ii) is user category-oriented in context of the use table. In the Norwegian NA, price and cost information is combined to construct more reliable price indices for output in the various construction industries.

The estimation method may be described by means of a model formula for a weighted correction factor , which gives a weighted average of constant price estimate without correction and with full correction against price index for new dwellings.

3. Sector statistics – residential houses, building/construction, market for houses.

3.1 New houses.

For new houses input price index may be used to describe the changes in cost components. Such indexes may be based on data for materials, manpower, plant and equipment, transport, energy and other cost. Such indices are often used to regulate construction contracts.

Output price indices are producer price indices for the construction industry. Data for prices paid may be collected from purchasers. These indices are used as input for the deflators for the construction industry in National Accounts. Land should not be included. Such indices should not include fees paid to architects etc and does not include fees paid VAT or finance cost.

Other types of seller’s price indices that for example include all cost including architects and fees paid may also be produced.

These indices need to use methods that corrects for changes in quality e.g. caused by variations in coverage for houses sold in a period - like hedonic methods. Separate indices may be constructed for the different types of houses like detached houses, houses with several dwellings and multi dwelling houses.

3.2. Used houses, residential property price indices (RPPI)

In many countries we have observed a shift in general interest from construction of new dwellings /houses to the market and prices for all dwellings/houses – especially for used dwellings/houses.

At present in many countries statistics is produced outside the family of official statistics, by private agents associations etc.

There may historically be a lack of international standards in this field and ongoing work (Eurostat and Statistics Netherlands) which has as the aim to produce a handbook would be welcomed.

Data and proper statistical methods are challenges for these indices. Hedonic methods or if available repeated sales (same house) are the methods that are most common.

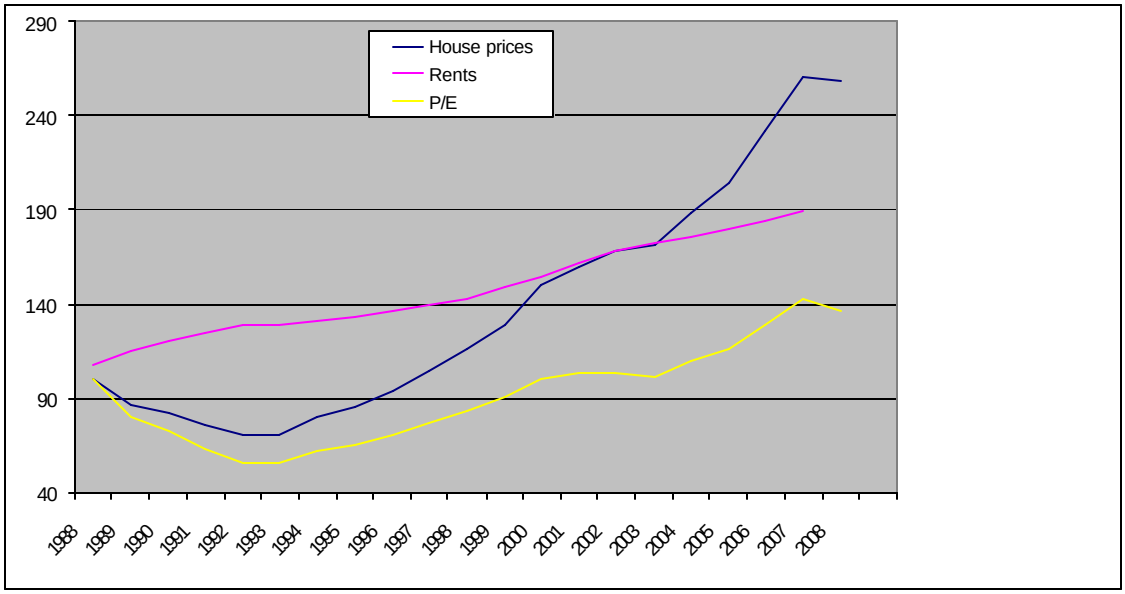
In Norway, the purchaser price and data about quality characteristics are from an internet market for houses (www.finn.no.) In addition we add complementally information about housing characteristics from the cadastre. The database is systematically updated by the agents with transaction. The number of observations is high and the data are stratified in rather detail. The hedonic method is rather crude. The weights that are used for the total index are extracted from estimates of total dwelling stock in each stratum.

4. Cost of living and residential prices

In Norway as in many other countries the proportion of owner occupied houses is high. Houses are regarded as durable consumer goods and three approaches – acquisition, user cost and rental equivalence - can in general be applied to the purchase of a durable good (in the Consumer Price Index). The acquisition approach can be said to ignore the problem of distributing the initial cost of purchase (of a dwelling) by simply use the initial (market) price in the CPI formula.

The rental equivalence method imputes a price (value) on the service by using the corresponding market rental for a similar dwelling. The house prices are in this case not directly included in the CPI. This is rather similar to the NA approach for services produced by housing sector (and is the preferred method in our national CPI). The data used as input are the rental prices from the rental statistics for dwellings.

It is of interest to examine the time path for rents and house prices. See diagram 1:



In the years 1988 – 1993 rents and house prices had opposite trends. Since 1994 they have both increased but with a more rapid change in house prices.

User cost as the third method may be imputed by alternative (foregone) earnings, either by an imputation of rentals that could be received if the house had been rented on the market, or the capital income that could have been received if the house had been sold and the capital invested (put into a bank account).

In Norway we have access to data for housing rentals and their corresponding physical characteristics and use a hedonic method.

The international recommendations are unclear on this subject. The European Harmonised CPI will probably include the (net) acquisition approach for OOH. This index is on the other hand not a cost of living index but an index used for inflation targeting.

5. Inflation, monetary policy and house prices

In many countries it has been implemented monetary policy with inflation targets. I Norway the Ministry of Finance has decided on principles and targets to be followed by the Central Bank and in these written principles it is stated that the target is defined based on the CPI. The forward looking perspective is interpreted in a way that has led Statistics Norway to publish a CPI adjusted for indirect taxes and energy prices.

The Norwegian HCPI has not a special status as inflation indicator for the Central bank. In Norway as in other countries we will find an active critical debate about what kind of inflation indicator that is the best. Since the CPI uses the rental method and rents may have different time path compared to house prices – CPI may be misleading. Such a hypothesis is supported by the cycles in the P/E-ratio. Moreover, some countries have only small and concentrated rental markets. Thus, imputation of house consumption for owner-occupiers in large houses on the basis of rents in small apartments may contain serious biases.

In the Research Department of Statistics Norway a research project is ongoing that involves using house prices to compute the price of housing. This method lets the analyst compute what a purchaser of a home would have to pay, or would have had to pay had the consumer been on the market, for the consumption of owner-occupied housing services, over a given holding period, leaving investment returns aside. Capital gains are ignored, so the method corrects the user cost concept. It includes *only* interest payments, maintenance costs, and transactions costs. Recent published results indicates a much higher inflation rate when this method is used. (Beatty, T.K.M., Røed Larsen E., Sommervoll, D.E. 2010)

6. Household wealth, taxation

Housing stock will in most countries be an important part of the households wealth and therefore essential in economical analyses on individual and macro level. In addition, countries are committed to follow international statistical co-operations, like the EU-SILC collaboration (European Survey of Income and Living Conditions), which require accurate wealth values.

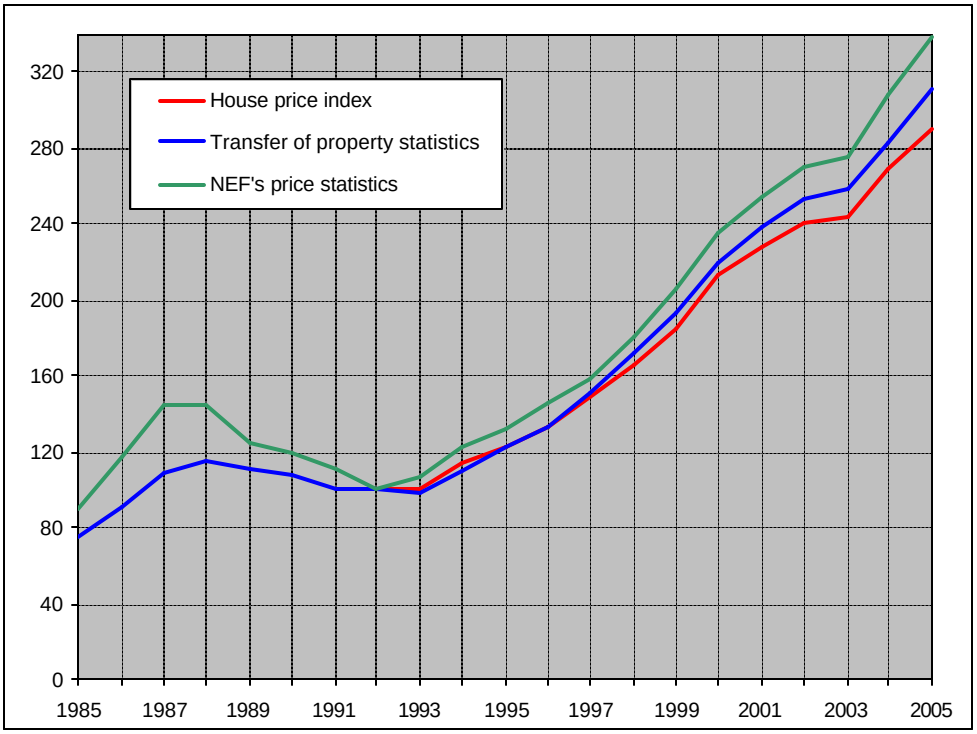
Statistics Norway started compiling estimates for house market values in 2007, by using the hedonic method, first for detached houses and in 2009 for multi dwelling houses. The data sources are the same as in our House price index. This method has also been used by the Ministry of Finance in a new calculator for assessment of houses for taxation.
A linear regression equation is chosen, with the price per square metre as a dependent variable. The calculation and classification of price zones are based on five years of price observations. Price functions are compiled for each of three types of dwellings

7. Financial stability and housing market.

There is a strong link between house prices and financial stability. Bubbles on housing markets will create shocks into the financial market when the bubbles burst. The previous bank crisis Norway and the recent international crisis are proofs of this. The responsibility for monitoring the financial stability is outside the scope of Statistical offices but statistics should be disseminated in a useful way for this purpose. This is an area open for improvements from official statistics.

8. Independent indicators and non official statistics

In many countries as in Norway there are indices and information about changes in house prices that are produced outside the national statistical office. Some of them may be in accordance with the quality criteria for official statistics but it is also to observe that some of these independent indicators are disseminated by market operators. In Norway the private indicator is published monthly while Statistics Norway's indicator is quarterly. The private indicator does also use hedonic methods. The time series of the two indices are rather equal. See diagram



9. Concluding remarks

A program for official statistics of housing prices has to take on board the several uses – as deflators in National Accounts, Cost of living, inflation targeting and the price changes on housing markets that the household face. It should be advised to find solutions for each part that takes care of consistency through the full system of official statistics. There are several methodological challenges – like implementation of hedonic methods. It is also observable that there seems to be a lack of basic classification systems for houses, dwellings and quality criteria. How to measure the size of the dwelling and eventually how to include land (size). There will also be several possible definition of the price. A full program has to include the classifications and concepts.

References:

Beatty, T.K.M., Røed Larsen E., Sommervoll, D.E.: Using house prices to compute the price of housing in the CPI. Article in Press Economic Letters 2010, doi: 10.1016/j.econlet.2009.12.009).