

## NO – Norway

Statistics Norway publishes a nationwide house price index for existing, detached houses. The index is constructed using the hedonic method with mix-adjustment techniques. Regression analysis is used to describe the relationship between a dwelling's market price and its individual characteristics. The hedonic model used by Statistics Norway includes a limited number of explanatory variables. No attempt is made to adjust for a dwelling's quality or age, only dwelling size and location factor into pricing estimates. To account for this limitation, mix adjustment techniques are used. Dwellings are first divided by type and price level, and regression analysis for each group of dwellings is performed. The price (per dwelling) is estimated relative to base year characteristics. Each group is weighted by the value of the housing stock. The base year is updated in the second quarter of every year, forming an annually chain-linked index. Starting in 2012, the series excludes sales of new dwellings, which make up between 1-3 percent of the observations.

The weighting scheme has undergone revisions. From 1997 to 2002, the total housing stock was used to weight the index. From 1992 to 1997, the number of sales transactions was used as a weight. There have also been revisions to the sources of data. Prior to 2002, Statistics Norway obtained price data from two different sources, the *Ground Property, Address and Building* (GAB) Register and a questionnaire distributed directly to the contractors. The house price index is now based on data obtained through *FINN.no*, which gathers data from multiple real estate agencies: the Norwegian Association of Real Estate Agents (NEF), the Association of Real Estate Undertakings (EFF), and the Norwegian Federation of Cooperative Housing Associations (NBBL). This allows more transactions to be included in the calculation of the index, and a more timely release of the index.

The Statistics Norway house price index is reported at a quarterly frequency and begins in the first quarter of 1992. To extend the data, we use a house price series put together for the *Norges Bank's* RIMINI model of the Norwegian economy and obtained upon request. The *Norges Bank* data is itself a compilation of four nationwide house price indexes. From 1987-2004, it corresponds to the house price index constructed by the *Norges Eindomsmeidlerforbund* (NEF) real estate agency, based on voluntary reports of real estate agents regarding sales of dwellings. From 1984-1986, the index uses data gathered by the GAB register. From 1979-1983 the series uses the price index for building costs compiled by Statistics Norway. From 1972-1978, this series is constructed using the deflator for the housing rent component of the CPI.

The house price series are quarterly, but not seasonally-adjusted by the different sources. We splice the Statistics Norway house price series using the growth rates from the *Norges Bank* series. We seasonally-adjust the spliced series method BSTS model and re-base it to 2005=100. We deflate this house price series using the Personal Consumption Expenditure (PCE) deflator obtained from the OECD Economic Outlook database.

We complete the Norwegian data by including Personal disposable income (PDI) reported in *per capita* terms. We originally used interpolated PDI data and working age population data from the OECD Economic Outlook database. The source of the current PDI and working age population data changed, affecting the PDI *per capita* series in the 2012 first quarter update and all

subsequent updates. Net disposable income data for households is collected from Statistics Norway. The series is reported at a quarterly frequency starting in 2002. The series is largely influenced by seasonal factors, so we use the BSTS model in state-space form to identify and systematically extract the seasonal and excessively volatile components of the data..

We use two annual series to extend the PDI series from Statistics Norway back to 1975. From 1978 to 2001 we use the net disposable income series from Statistics Norway. From 1975 to 1977 we use the net disposable income series from the OECD Outlook 86 database. The two annual series are spliced together. This spliced series is then interpolated to a quarterly frequency using the quadratic-match average method. The resulting quarterly growth rates are used to extend the series.

Current working age population data is now obtained from the OECD Main Economic Indicators database. It is reported at a quarterly frequency and begins in the first quarter of 2000. We use the quarterly growth rates of the discontinued working age population series from the OECD Outlook 90 database to extend the series to the first quarter of 1975. To compute the PDI *per capita* series we divide the PDI by the working-age population. We use the PCE deflator to report PDI *per capita* in real terms. Both nominal and real PDI measures are re-based to 2005=100.

#### *References:*

Brodin (1989): "Mikrokonsumfunksjonen i Rikmod. (Micro-Consumption Function in Rikmod)."

#### *Information Resources:*

Statistics Norway Data

[http://www.ssb.no/english/subjects/08/02/30/nos\\_d372\\_en/nos\\_d372\\_en.pdf](http://www.ssb.no/english/subjects/08/02/30/nos_d372_en/nos_d372_en.pdf)

[http://www.ssb.no/vis/bpi\\_en/about.html](http://www.ssb.no/vis/bpi_en/about.html)

[http://www.ssb.no/knri\\_en/](http://www.ssb.no/knri_en/)

[http://www.ssb.no/nri\\_en/](http://www.ssb.no/nri_en/)

Norges Bank Data

<http://www.norges-bank.no/en/price-stability/historical-monetary-statistics/house-price-indicies/>

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