



## **Owner-Occupied Housing in the Norwegian HICP**

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### **Abstract**

In this paper, Statistics Norway analyses the impact of including Owner-Occupied Housing (OOH) in the Norwegian Harmonized Index of Consumer Prices (HICP) based on the net acquisition approach. Expenditure shares for OOH according to the net acquisition approach are estimated based on different sources. Different candidates for measuring the price development are evaluated in relation to the Technical Manual on OOH for HICP. Furthermore, the paper presents the effect of implementing OOH in the HICP. This analysis shows that the inclusion of OOH by using the existing House Price Index increases the Norwegian HICP, on average, by 0.5 percentage points per year in the period 1996 to 2007. The period in question is characterised by a very sharp increase in housing prices.



## 1. Introduction

The Harmonized Index of Consumer Prices (HICP) is primarily designed for comparison of price development between European countries. The Owner-Occupied Housing (OOH) is for the time being excluded from the HICP. A pilot study on the OOH among most of the European countries is still in progress. The third phase of the pilot is due to be completed in March 2010 together with a final report. The aim of the pilot is to develop a system of price indices connected to the purchase of dwellings for possible inclusion in the HICP based on the net acquisition approach. The scope of the pilot also encompasses establishing a price index for major repairs and maintenance, other costs related to purchase of a dwelling and insurance for owner-occupiers. Although these costs might be considerable, they are not included in this analysis. As a result of the ongoing pilot project, and despite the fact that Statistics Norway is not part of the pilot, Statistics Norway nevertheless recognises the need to analyse the effect of implementing the OOH in the HICP for Norway based on the net acquisition approach.

The Norwegian consumer price index (CPI) is defined as a cost-of-living index, which measures the change in the households' cost of maintaining a given level of welfare. In the CPI, the purchase of dwelling is considered an investment in fixed capital formation, which in turn yields a flow of services during the lifespan of the dwelling. Measuring price changes of the services that the dwelling provides is in line with the theoretical foundation of a cost-of-living index. In the Norwegian CPI, the OOH is measured according to the rental equivalence approach.

The HICP, on the other hand, is an inflation index that is limited to monetary expenditures. A method more consistent with an inflationary target is the net acquisition approach where the development in dwelling prices is used as a measurement for OOH. The purchase of a dwelling is then considered a consumer durable and not an investment in fixed capital formation. Perhaps a more correct way of looking at it might be that purchase of a dwelling both consists of a consumption element and an investment element. One possible way to address this issue is to consider the land prices as an investment and the structure as consumption. In practice however, it might be difficult to separate the two components.

According to the net acquisition principle, only transactions between the household sector and other sectors should be covered. Calculations imply that the weight for OOH will be far lower compared to the weight in the Norwegian CPI based on the rental equivalence approach. Since 1993, housing prices have experienced considerable growth, far beyond the overall HICP. Therefore, implementing the OOH based on the net acquisition approach in the period of 1996-2007 is expected to pull the overall HICP up.

The remainder of this paper is organized as follows; section 2 describes the Norwegian housing market. Section 3 outlines the net acquisition approach. In section 4 different sources for deriving the weight are considered and expenditure shares are estimated, while in section 5 different candidates for measuring the price development are evaluated. Furthermore, in section 6 the effect of implementing the OOH in the Norwegian HICP based on the net acquisition approach is analysed, and finally section 7 gives some concluding remarks.

## 2. Norwegian Housing Market

### 2.1 Owner-occupiers in Norway

The Norwegian housing market is dominated by owner-occupiers. According to the Population and Housing Census 2001, a total of 77 per cent of Norwegian households own their dwelling while 23 per cent are tenants. The high share of owner-occupiers goes back to the Post War period. The housing needs at that time in Norway were formidable and there was a strong focus on social housing and to ensure housing for all. The Norwegian Government through the Norwegian State Housing Bank strongly influenced the housing market by constructing new dwellings and providing loans, housing



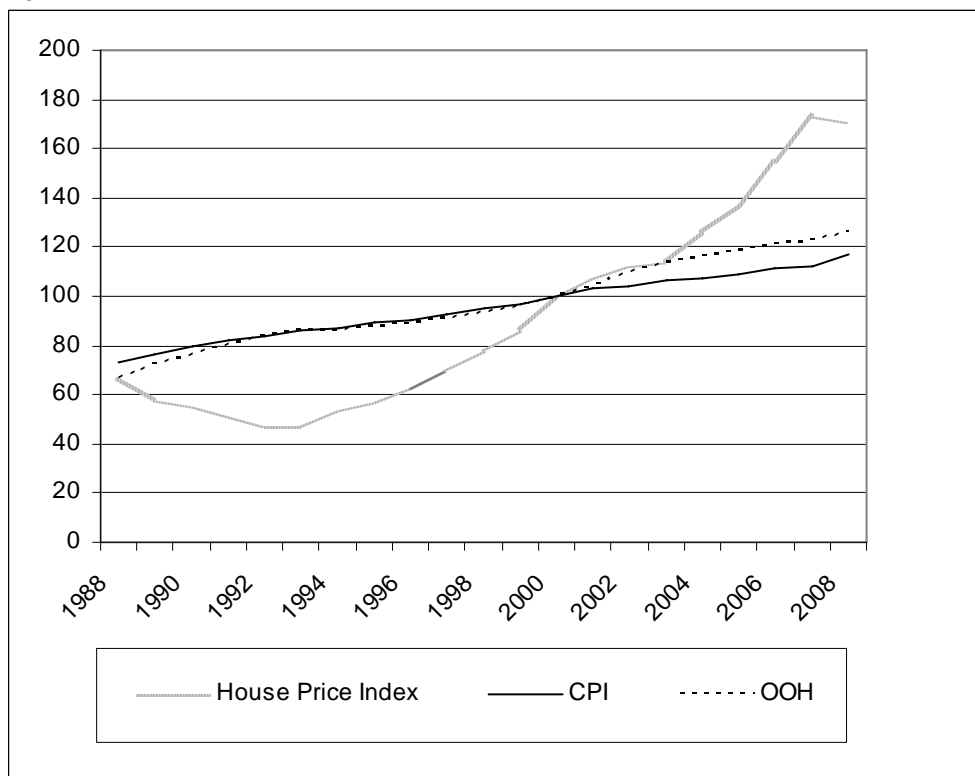
grants and housing allowances. Due to the Norwegian housing policy, the share of owner-occupiers increased strongly in the decades after World War II.

The low tax burden on housing is probably another reason why the share of owner-occupiers remains high in Norway. The housing taxation is based on the imputed value of the house, which is far lower than the actual market value, resulting in a lower taxation burden compared to other capital investments such as bank deposits. Dwelling purchases are often financed by means of credit and owner-occupiers can fully deduct interest payments from taxable income. In addition to provide a shelter, the dwelling may be regarded as an investment object and an important part of people's savings. Purchasing a dwelling and paying instalments can thus be seen as a kind of forced saving under favourable conditions. The strong growth in housing prices during the last 15 years has also made it profitable and desirable to be an owner-occupier in Norway.

## 2.2 Housing prices in Norway

Housing prices in Norway have increased sharply for the last 15 years. In the early 1980s, deregulation and privatisation in both the housing and credit market caused strong growth in housing prices. In the period of 1988-1993, Norway faced a recession corresponding with a major decrease in housing prices, approximately 30 per cent<sup>1</sup> in this period. From 1993 to 2001, the housing prices went up by an average of about 10 per cent each year. In 2002 and 2003, the growth rate was somewhat reduced, but in the period 2004-2007 it sharply increased again. In 2008 however, prices went down due to the latest poor economic development, as illustrated below in figure 1.

Figure 1. House Price Index, total CPI and OOH in the CPI, 1988-2008. Index 2000=100.



Source: Statistics Norway and Norwegian Association of Real Estate

As illustrated in figure 1, the OOH, measured by the rental equivalence principle, and the overall CPI had a similar price growth in the period 1992-2001. Since 2001, the OOH has increased more than the overall CPI. During the last 20 years, housing prices have increased by more than 150 per cent,

<sup>1</sup> From 1992-2008, the figures are based on Statistics Norway's House Price Index. From 1988-1991, figures are taken from the Norwegian Association of Real Estate.

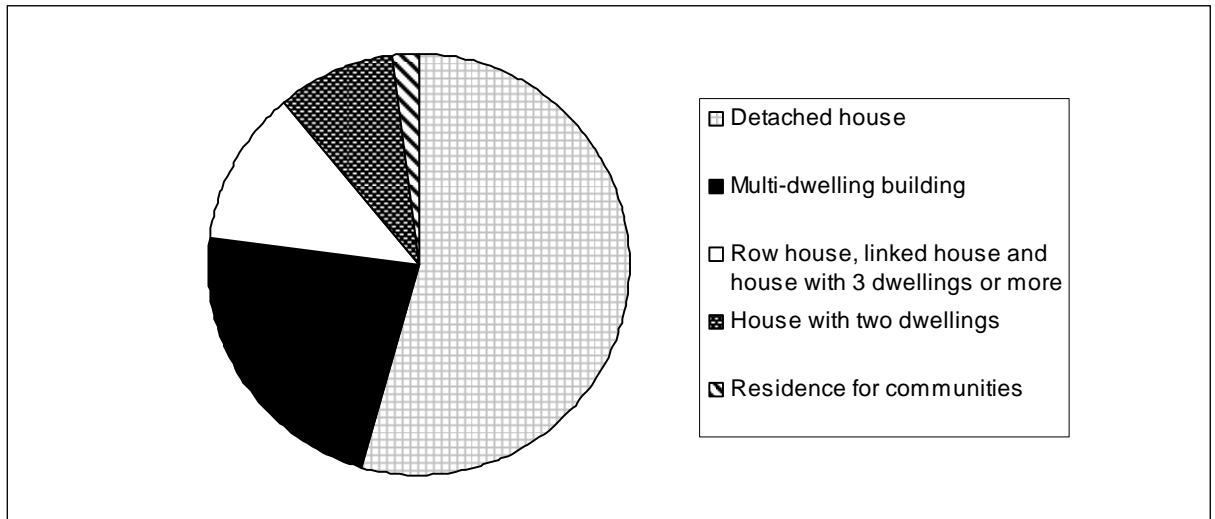


compared to a 60 per cent increase in the overall CPI, indicating a considerable real growth in dwelling prices.

### 2.3 Norwegian dwelling stock

According to Statistics Norway's Building stock statistics, there are 2.3 million dwellings in Norway, of which 1.2 million are detached houses, see figure 2 below.

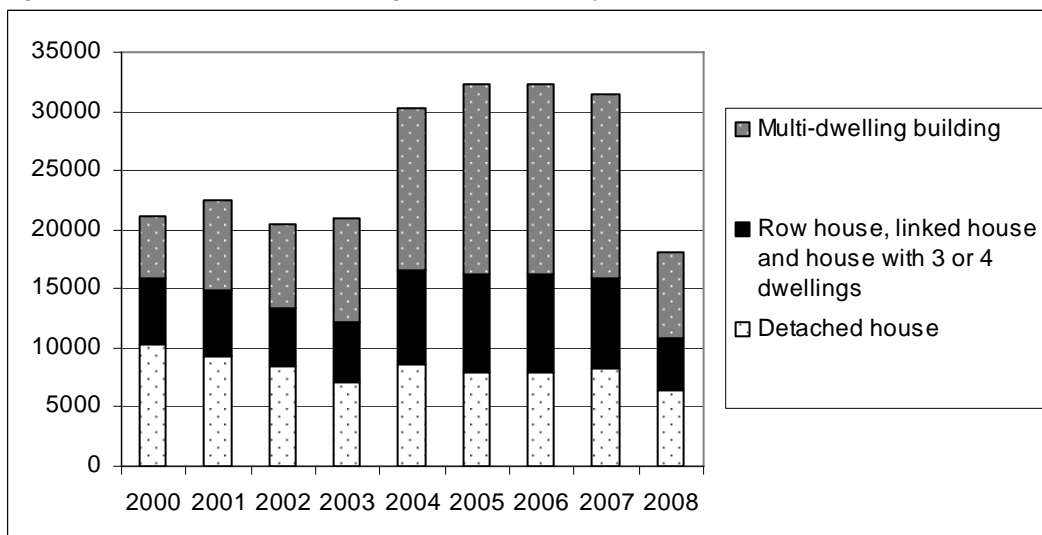
Figure 2. Dwelling stock in Norway, 2008



Source: Statistics Norway

According to Statistics Norway's Building statistics, building activity was at a high level during the 1970s. From 1971 to 1976, the number of new dwellings reached over 40 000 each year. From the end of the 1970s, the number of new dwellings each year declined, and was reduced to less than 16 000 in 1992. From 2003 to 2004 the building activity increased considerably to approximately 30 000 new dwellings. In 2008, due to a deep economic decline, the number of new dwellings strongly dropped, as illustrated in figure 3 below. There has also been a construction shift in Norway from detached houses to multi-dwelling buildings, also illustrated in figure 3. The construction of flats in multi-dwelling buildings in Norway has increased strongly during the last years, 15.1 per cent are situated in buildings built in 2001 or later, while only 5.3 per cent of the 1.2 million detached houses were built in the same period.

Figure 3. Number of new dwelling starts in Norway. 2000-2008





Source: Statistics Norway

### 3. Net acquisition approach

The choice of approach for measuring OOH depends on the purpose of the index. If the purpose is a cost-of-living index, the rental equivalence and the user cost approach are consistent with the overall purpose. Purchasing a dwelling is then considered an investment in fixed capital formation, which in turn yields a flow of services during the lifespan of the dwelling. The rental equivalence principle, which is applied in the Norwegian CPI, is based on the idea that the value of services the owner-occupier receives from the dwelling has the same development as equivalent dwellings in the rental market. The user cost approach reflects both the cost of using the housing services in which the durable provides and the investment which must earn some exogenous rate of return.

The acquisition approach is more consistent with an inflation index, since an inflation index such as the HICP, should only cover monetary transactions and not imputed values. The net acquisition method implies that only transactions between the household sector and other institutional sectors should be covered. Transactions between the household sector and other sectors mostly consist of new dwellings, while transactions of second-hand dwellings mainly take place within the household sector. When applying the net concept, only the net effect of the transactions should be taken into account, which means that purchases less sales between the household sector and other sectors should be included. In this analysis, finding a source for estimating the expenditures of second-hand dwellings between other sectors and the household sector has been difficult. Assuming that the purchase of second-hand dwellings from other sectors to the households is minimal and that the sales from the households to other sectors is equally small, the net effect will be negligible and these transactions are therefore excluded from the weights.

The net acquisition method might cause more volatility in the expenditure share compared to the rental equivalence method. Depending on the variation in the building activity for new dwellings and the housing prices, the weight might be based on an average of up to three years according to the Technical Manual on OOH. A price index representing OOH in the HICP should ideally be of a monthly frequency. However, depending on volatility and the extent of the building activity, a monthly price index might consist of a small number of price observations. In this case, methods for deriving monthly data from quarterly statistics might be applied. Otherwise, quarterly statistics might be regarded as a “second-best” solution, see annex 1 “The ideal index”.

The timing for when the transaction should be included in the HICP is of great importance. The acquisition approach ignores the fact that many goods are consumed over some period of time, and focuses entirely on the total value of acquisition at the time of purchase. In the case of OOH the timing target is the first binding contract between the seller and the purchaser, and not when the consumption actually starts.

The purchase of a dwelling can be included in the scope of HICP on the grounds that the dwelling is treated as other consumer durables. However, purchase of a dwelling is also considered an investment in addition to satisfying consumers’ need for shelter. It may be argued that the acquisition of a dwelling consists of a consumption element and an investment element. One possible way to address the issue is to consider the land prices as the investment component, and the structure as the consumption component. However, separating the land prices from the structure is rather difficult. Another way to deal with the issue is to use a “net weight, gross price” approach, which implies that the land prices are excluded from the weight, but included in the price measures. Methods for excluding land prices from the price measures and whether the “net weight, gross price” approach will be accepted is an ongoing discussion in the pilot project on OOH.



#### 4. Weights

The National Accounts is chosen as the most appropriate source for deriving the weights for owner-occupiers according to the net acquisition approach. This is in line with the provisional recommendations in the Technical Manual on OOH. As of January 2011 the household budget survey (HBS) as the main source for deriving the weights in the Norwegian CPI and HICP will be replaced by the National Accounts. The National Accounts' definition of investment in Residential Fixed Capital Formation is closely related to the net acquisition principle. Another advantage of using the National Accounts as a weight source for OOH is the possibility for deriving weights for major repairs and maintenance, including other costs related to the purchase of a dwelling.

In the National Accounts, the assumption is made that all investment in Residential Fixed Capital Formation is carried out by the household sector. This assumption might lead to an overestimated weight since some investment is made by other sectors as well. The business and the public sector may also make some investment in Residential Fixed Capital Formation with the aim of renting out the dwelling. In addition, private households acting as landlords are also included in the Residential Fixed Capital Formation investment.

The acquisition of new dwellings to the household sector consists of dwellings purchased from other sectors and self-builders. "Step-by-step" self-builders who purchase the materials and actually do the work themselves comprise of a rather small share in Norway and are therefore left out of the scope of this analysis. Major repairs and maintenance are also left out of the scope of this analysis due to a possible double accounting problem<sup>2</sup>. Neither will other costs related to the purchase of a dwelling be covered in this analysis. It has not yet been possible to distinguish self-builders who involve a building firm or purchase prefabricated houses from households' purchases of dwellings from other sectors.

One way to define the weight for OOH based on the National Accounts is, according to the OOH Manual, to multiply the ratio between the investment in Residential Fixed Capital Formation and the actual rentals with the weight for actual rentals in the HICP. In this analysis another approach for deriving the weight is chosen in order to avoid inconsistency, as the weights in the Norwegian HICP are based on the HBS and not the National Accounts. The average OOH expenditure per household based on the National Accounts is calculated by dividing the total value of investment in Residential Fixed Capital Formation by the total number of households. The weight share for OOH is then derived by dividing the average OOH expenditure per household by the total average expenditure per household including OOH. When including OOH, the remaining weights in the HICP are recalculated.

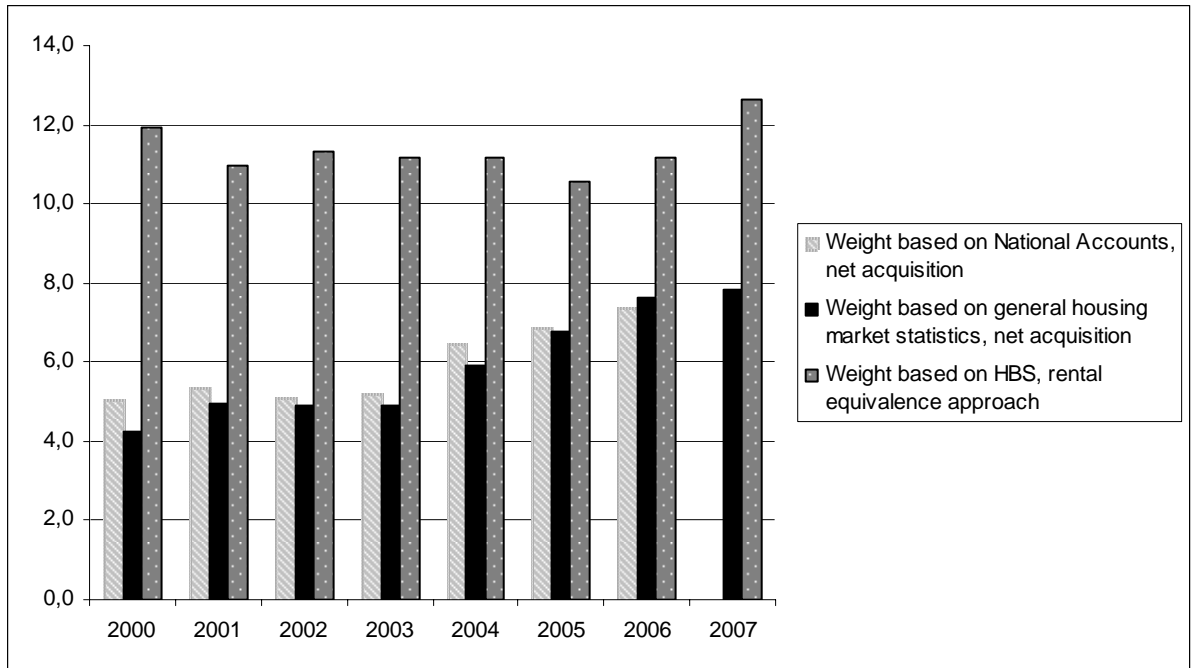
An alternative source to the National Accounts for deriving the weight for OOH is general housing market statistics. Based on the assumption that the first binding contract is signed somewhere between the building work starts and the buildings are completed, an average of these numbers is used in the estimation of the expenditure shares. An average price of different types of dwellings is multiplied with the number of new dwellings during a certain period of time (one year in this analysis), which indicates the total value of new dwellings. To obtain an average OOH expenditure per household, the total value is divided by the total number of households. The weight share is then derived by dividing the average OOH expenditure per household by the total average expenditure per household including OOH, the same procedure as described above for the weights based on the National Accounts. A comparison of the weights based on the two different sources according to the net acquisition approach, including the weight for OOH in the CPI based on the rental equivalence method is presented in figure 4 below.

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<sup>2</sup> The weights in the HICP are based on the HBS. However, in order to carry out this analysis, the expenditure share for OOH is based on the National Accounts. In the HBS, minor repairs and maintenance have a broader definition than in the National Accounts, which may result in double accounting if major repairs and maintenance are included in the analysis.



Figure 4. The weight for OOH based on different sources and approaches. Per cent. 2000-2007<sup>3</sup>.



The weight for the rental equivalence approach is based on a three-year average of the HBS, while the weights according to the net acquisition approach based on National Accounts and general housing market statistics are both referred to one year only. The two sources for deriving the weight for OOH according to the net acquisition approach show very similar results. This is however not very surprising considering the fact that the National Accounts uses general housing market statistics as a source for calculating the investment in Residential Fixed Capital Formation.

The weight according to the rental equivalence approach varies between 10 and 13 per cent from 2000 to 2007, as illustrated in figure 4. In comparison, the weight according to the net acquisition approach is just above 5 per cent in 2000 based on the National Accounts, and remains rather stable up to 2004. From 2003 to 2004, the expenditure share makes a jump of more than one percentage point to 6.4 per cent due to a strong increase in building activity. From 2005 to 2006, the share rise further by half a percentage point to 7.4 per cent mainly as a result of increased housing prices. The weight according to the net acquisition approach is calculated back to 1991 based on the National Accounts. The expenditure share is just above 4 per cent in 1991, and goes down by almost one percentage point from 1991 to 1993 due to decreasing housing prices. In 1994, the expenditure share rises to 4.4 per cent, which can be explained by a large increase in the number of dwelling starts combined with an upward price movement.

## 5. Evaluating Statistics Norway's House Price Indices

Statistics Norway publishes different price indices for the housing market. These indicators are fairly newly established statistics. The Price Index of New Multi-Dwelling Houses for instance, was first published in 2005. Below we evaluate the existing price indices according to the desired OOH index characteristics outlined in the Technical Manual on OOH for HICP. The indices that are evaluated are as follows;

- House Price Index
- Price Index of New Detached Houses

<sup>3</sup> The National Accounts' figures are based on final annual version, resulting in a 2-year time lag and therefore missing 2007 figures.



- Price Index of New Multi-Dwelling Houses

The indices are evaluated in relation to an ideal HICP price index or a “first-best” solution. The evaluation criteria are still provisional, the characteristics of an ideal index are still under discussion in Eurostat and among the Member States as a part of the ongoing pilot study. In practical index work, data constraints and practical problems can make an ideal index difficult to achieve. Nevertheless it is important to use an ideal index as a starting point when evaluating or developing new indices. In addition to the desired requirements set down in the Technical Manual on OOH, the basic HICP framework and requirements have to be applied according to the Commission Regulation (EC) No 1749/96<sup>4</sup>. It is important to add that the evaluation of the existing indices within the general HICP context is not within the scope of this paper. If a regulation is introduced it will be important to evaluate the existing indices in relation to general HICP requirements as well. In addition, the aim of this paper is not to come up with ways of improving the existing indices, but rather to describe the characteristics of the existing house price indices in relation to the OOH Manual. However, with a future regulation in place, further focus on the price indices will be crucial. Annex 2 summarises the different characteristics of the existing price indices in Norway.

### 5.1 House Price Index

According to standard HICP regulations, the price index is to reflect the changes in monetary prices actually paid by consumers. The House Price Index is a selling price index and therefore in accordance with the requirement. Also the timing of the price is in accordance as the price registered is the price put down in the first binding contract. The House Price Index is published quarterly, which is targeted as a “second-best” solution or as a B method in the manual. How to classify quarterly house price indices is still under discussion in the pilot study. Ideally an HICP is to be compiled as a monthly index, but many countries may have difficulties compiling such an index as the number of transacted new dwellings can vary. The results of the statistics are published 3-4 weeks after the end of each quarter, which is close to the general HICP standard, but not a fully satisfying solution as the Norwegian HICP is published 10 days after the end of the reference month. The timeliness of the statistics will however be improved in the near future, by advancing the publication date.

The House Price Index is what Eurostat calls a “Stand-Alone House Price Index”, meaning indices that are of interest in their own right. These indices do not use the net concept, so one of the obvious weaknesses from a net acquisition point of view is the coverage of second-hand dwellings. The share of newly built dwellings in the Norwegian House Price Index is only marginal: less than 2 per cent of all the observations. Comparisons made in Official Statistics of Norway (D363) between second-hand multi-dwelling houses and new multi-dwelling houses in the period 2000-2005 show that the prices of new blocks of flats have increased somewhat more than the prices of the second-hands, while small second-hand multi-dwelling houses have had a similar price development as small new multi-dwelling houses in this period.

Another weakness is the treatment of land prices. As the land might be regarded as an investment and not consumption, land prices should be excluded. Land prices in the House Price Index are however included.

For the calculations, the House Price Index uses hedonic techniques in combination with classification, which is in line with the recommendations in the Technical Manual. The index is first classified by price zone and type of dwelling, and thereafter calculated by a hedonic method using area and price per square metre as dependent variables. The method makes no corrections for different dwelling characteristics except size, which can cause an overestimation of the price development in periods with high levels of construction activity. The indices of co-operative dwellings are calculated by using the simple average of square metre prices.

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<sup>4</sup> Requirements including the treatment of weighting, quality adjustments, formulas, missing prices etc.





### **5.2 Price Index of New Detached Houses**

The Price Index of New Detached Houses is a quarterly published output price index. It is nevertheless an approximation of a selling price index as VAT and profit margins are included in the price. Eurostat classifies output price indices as a C method, i.e. a non-acceptable method. Unlike the House Price Index, land prices are excluded from the index and therefore in accordance with the guidelines. The timing of the price is connected to the quarter in which the municipalities register the construction work as completed and not to the first binding contract. There is therefore a significant time lag in this index. The signing of the first binding contract often takes place before the construction work starts, therefore the time lag might be up to one year or more. The timeliness is also an important weakness; the results of the statistics are published about 3 months after the end of the quarter.

The Price Index of New Detached Houses is stratified by price zone and calculated by hedonic method. Unlike the House Price Index, the calculations make corrections for different dwelling characteristics as well as area.

### **5.3 Price Index of New Multi-Dwelling Houses**

The Price Index of New Multi-Dwelling Houses is an output price index. It's nevertheless classified as a selling price index excluding land prices, as costs such as connection to road, water and sewer services, duties and administrative fees, interest on building loans, client profits and VAT are included in the price. The timing of the price is close, but not entirely in accordance with the provisional requirements. The index comprises of multi-dwelling housing projects for which the Norwegian State Housing Bank has granted loans during a six month period and these loans are normally granted before or when the building commences. Normally 50 per cent of the dwellings are sold before building starts. Prices registered are based on the loan applications and are estimates of the final cost, and not the actual transaction price. In the HICP context, "asking price" is evaluated as a non-acceptable method.

The main weakness in this index, in addition to the price concept, is the frequency, since the statistics are published only twice a year. Since the data sources merely are based on accepted loan applications provided by the State Housing Bank, in times of poor economic cycles such as today, fewer projects are applying for loans, making it difficult to compile an index with a decreasing number of price observations. The low number of observations is also the main reason behind the poor periodicity of the statistics. The State Housing Bank projects cover about 50 per cent of the total population. The statistics are normally published about 4 weeks after the end of the reference period.

The Price Index of New Multi-Dwelling Houses is stratified by price zone and type of dwelling (small houses such as row houses and blocks of flats). Hedonic method is used within the stratum, making corrections for area and size.

### **5.4 Do the Norwegian house price indices fulfil the ideal OOH index requirements?**

The evaluation of the existing Norwegian house price indices shows that today none of the indices fulfil the desired characteristics of an ideal OOH index. The main weakness in the House Price Index is the lack of net concept. The main weaknesses in the Price Index of New Detached Houses are the price definition and the timing of the price, while it comes down to price definition and frequency in the Price Index of New Multi-Dwelling Houses. The index closest to the definitions set forward by the provisional Manual seems to be the House Price Index, where a "net weight, gross price" approach seems to be the most likely solution for the Norwegian HICP. In general, output price indices are more fitting as price indicators for self-builders involving building firms or self-builders with prefabricated houses, while the "step-by-step" self-builders should be represented by input price indices.

### **5.5 Land prices**

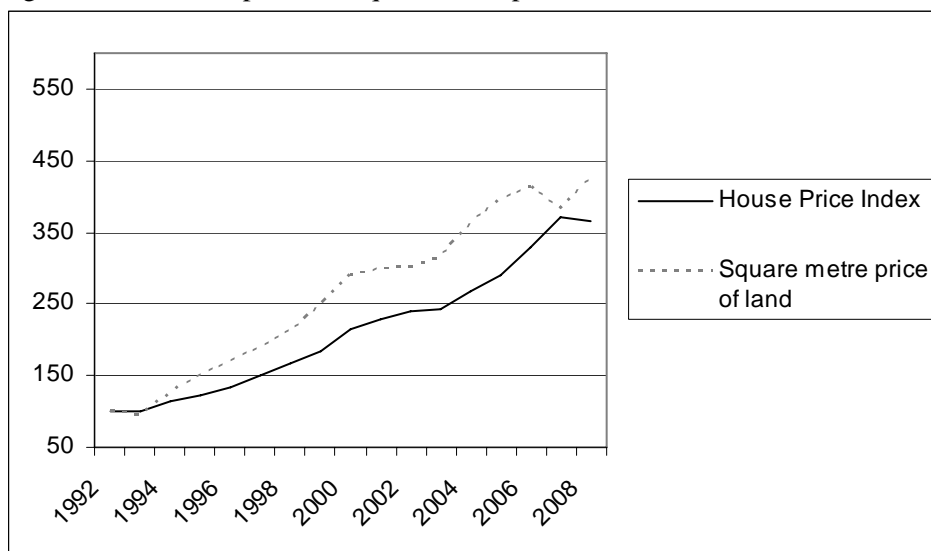
An analysis carried out by Thomassen (2007) shows that the land prices constitute less than 20 per cent of the total costs for new detached houses. From 1993 to 2006, the land prices comprise of between 16 and 18 per cent of the total costs. In Oslo however, the land prices vary between 23 and 32 per cent during the same period. This analysis implies that the investment element is much smaller compared to the consumption element of the total cost of new detached houses including land. As a result, the "net



weight, gross price” principle may be a reasonable approach, or at least serve as a good approximation. However, separating the land prices from the total cost of second-hand dwellings is difficult. Land prices for second-hand dwellings will probably constitute a larger share of the total cost compared to new dwellings. Since new dwellings are dependent on available land, transactions of new dwellings are often carried out in less pressured areas than transactions of second-hand dwellings. A comparison of the statistics “Prices per square metre of detached houses”, which includes the prices of land, shows that the average price in 2007 for second-hand detached houses is higher than for new detached houses in the Norwegian cities of Oslo, Bergen and Stavanger.

Figure 5 below shows the average price per square metre of land compared to the House Price Index. The square metre price statistics comprise of land sites below 20 decares for housing purposes. It is not published as an official statistics and is not calculated as a measure for the price development of land. Furthermore, the composition of the land stock in this statistics varies strongly over time as regards to the number of observations, standard of the land and location. With regard to the standard of land, the statistics comprise of both raw land in addition to worked up land with infrastructure such as roads, water, sewer and more.

Figure 5. The development in square metre prices of land and the House Price Index. 1992=100



Source: Statistics Norway

Despite the fact that the average price per square metre is not adjusted for differences in quality, it might still give an indication of the price development of land. Land prices in Norway have increased more than the House Price Index. The average price per square metre of land has increased by about 330 per cent from 1992 to 2008, while the House Price Index has increased by about 260 per cent in the same period.

An analysis by Christensen, Eide and Thomassen (2006) indicates minor deviations from including land prices in the Price Index of New Multi-Dwelling Houses in the period 2000-2005. The land prices may however have a larger potential impact on the price development of second-hand dwellings as discussed earlier. It may therefore be important to exclude land prices from the price indicators.

## 6. The impact of OOH in the Norwegian HICP

### 6.1 The price development of different OOH alternatives

In this section we analyse the price development of the different house price indices in the period 1996-2007 in an HICP context. One OOH alternative is the House Price Index and a “net weight, gross price”

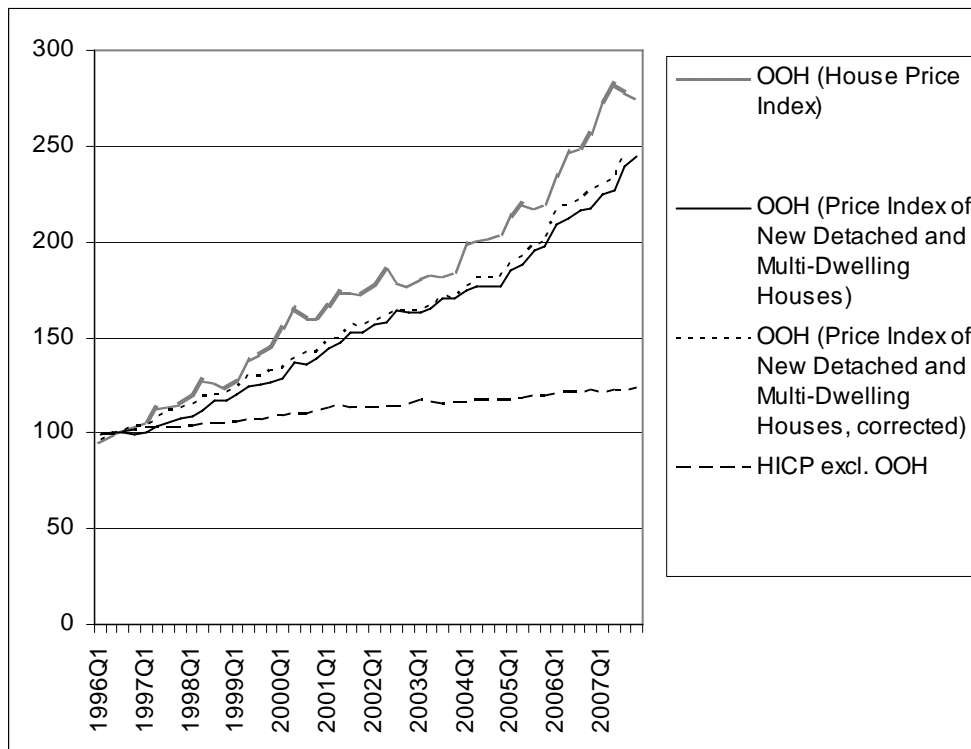


approach, a second alternative is an OOH index based on a combination of the Price Index of New Detached Houses and the Price Index of New Multi-Dwelling Houses. Due to the significant time lag in the Price Index of New Detached Houses we have also made a third OOH alternative based on the Price Indices of New Detached and New Multi-Dwelling Houses reversing the prices for new detached houses by one year, see section 5.2 for comments on the time lag.

In the period 1996-2007, the OOH represented by the House Price Index has increased by 189.0 per cent, far more than the OOH represented by the combination of Price Indices of New Detached Houses and New Multi-Dwelling Houses<sup>5</sup> with a price rise of 145.8 per cent in the same period. Reversing the prices of new detached houses by one year, rises the price growth somewhat to 156.0 per cent, but the growth in the House Price Index is still stronger, as shown below in figure 6. The stronger overall price increase in House Price Index is due to a sharper price increase in period prior to 2002. Despite some quarterly deviations in the period 2002-2006, the price growth in total is approximately the same for the different OOH alternatives. In 2006 and 2007, the House Price Index again shows a sharper price increase compared to the other OOH measures. In figure 7 below we analyze the OOH price development in the period after 2001 in more detail.

As of 2001 the Price Index of New Multi-Dwelling Houses is implemented in combination with the Price Index of New Detached Houses in the analysis. In the years 2001-2003, the expenditure shares of the purchase of new detached and multi-dwelling houses are approximately equal. In the period 2004-2007 there is an increasing gap between these expenditure shares demonstrating the building shift from new detached to multi-dwelling houses. In 2006 and 2007, the expenditure share of the purchase of new detached houses is reduced to less than half of the new multi-dwelling house expenditures.

Figure 6. Different OOH alternatives and HICP excl. OOH. 1996-2007. Index 1996=100.



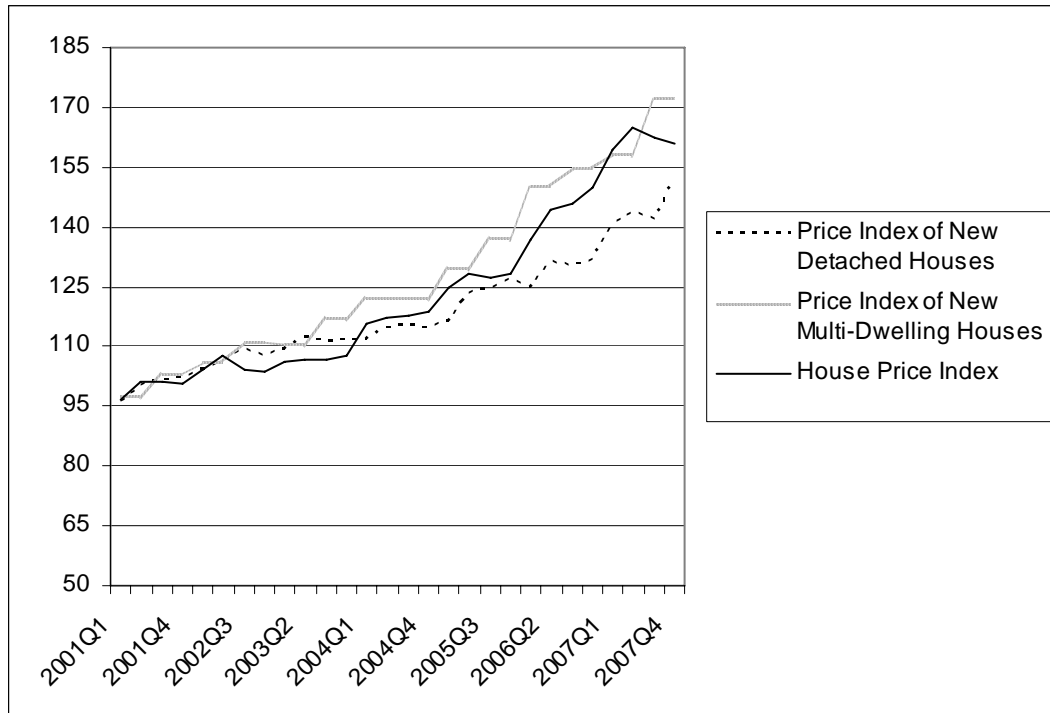
As illustrated below in figure 7, from the 1<sup>st</sup> quarter of 2001 to the 4<sup>th</sup> quarter of 2007 the Price Index of New Multi-Dwelling Houses has shown the sharpest price increase among the house price indices with

<sup>5</sup> Price Index of New Multi-Dwelling Houses goes back to 2001 in this analysis.



a growth of 77.0 per cent due to sharp price increase of blocks of flats during the last years. The Price Index of New Detached Houses has gone up 58.3 per cent while the House Price Index has shown a growth rate of 65.8 per cent in the same period.

Figure 7. House price indices. 2001-2007. 2001=100

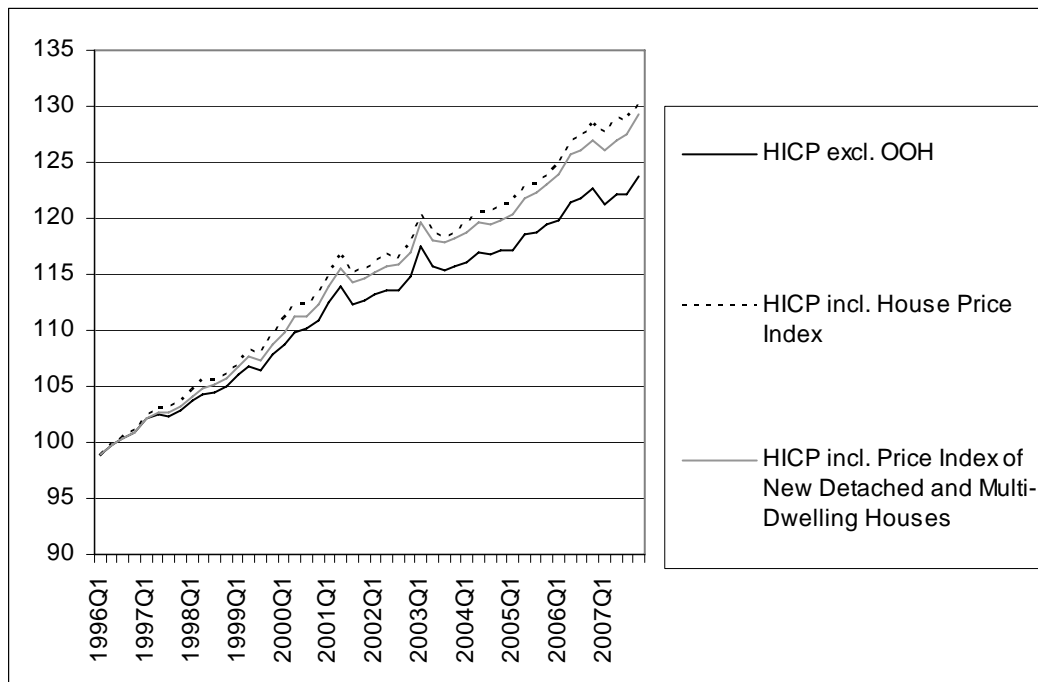


## 6.2. Effect on all-item index

Below we analyse the impact of the different OOH alternatives on the Norwegian all-item HICP in the period 1996-2007 from a net acquisition point of view. Figure 8 below shows that the OOH implementation makes a strong impact on the all-item HICP, despite a low weight according to the net acquisition approach. Due to the sharp increase in the Norwegian housing prices, including a rising expenditure share, the effect increases during the period in question. During the overall period from 1996 to 2007, the OOH represented by the House Price Index pulls the HICP up by 6.6 percentage points. Using a combination of the Price Indices of New Detached Houses and New Multi-Dwelling Houses as a measurement for OOH, the contribution is 5.1 percentage points to the overall HICP.



Figure 8. HICP excluding OOH, HICP including House Price Index and HICP including Price Index of New Detached and Multi-Dwelling Houses<sup>6</sup>. 1996-2007. Index 1996=100



Analysing the different OOH price measurement alternatives and their impact on the all-item HICP index, the different indices influence the all-item index in different degrees. On an annual basis, the inclusion of the OOH by using the House Price Index increases the official HICP, on average, by 0.5 percentage points per year in the period 1996 to 2007. In 2006 and 2007, the effects from the House Price Index are much stronger – up to a maximum of 0.9 percentage points, see table 1 below. Using the other price measurements for the OOH reduces the impact to approximately 0.4 percentage points on average per year, with a maximum deviation of 0.8 percentage points. The figures in table 1 below are also illustrated in Figure 9.

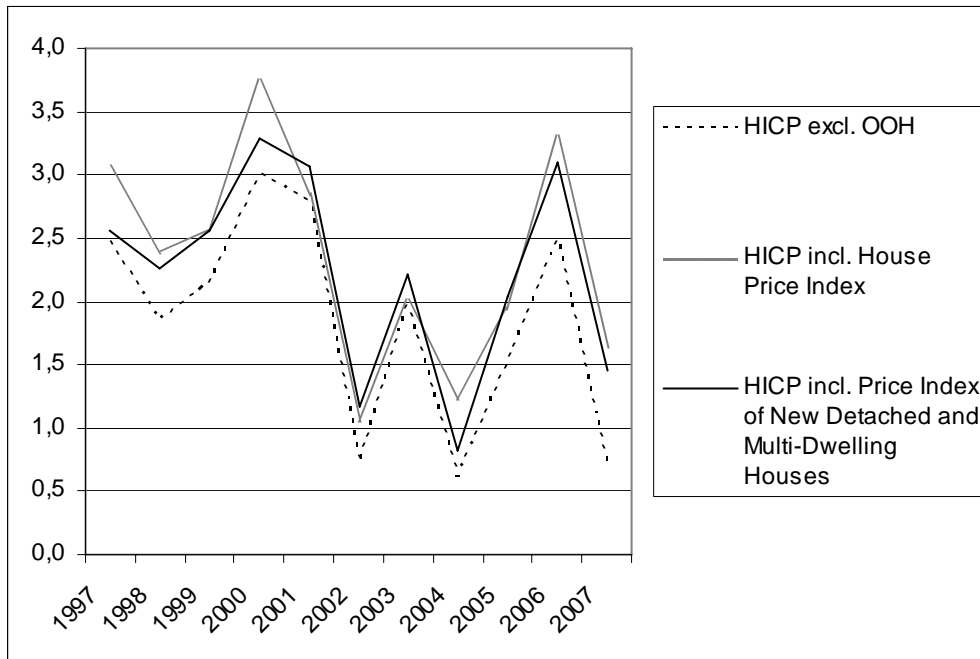
<sup>6</sup> In the period 1996-2001, the price development is represented merely on the Price Index of New Detached Houses. From 2001, the price development is represented by the Price Index of New Detached Houses and the Price Index of New Multi-Dwelling Houses.



Table 1. The official HICP and different OOH alternatives<sup>7</sup>. Annual growth rate. 1997-2007

	Official HICP	HICP incl. House Price Index	HICP incl. Price Index of New Detached and Multi-Dwelling Houses	HICP incl. Price Index of New Detached and Multi-Dwelling Houses, corrected
1997	2,6	3,1	2,6	2,8
1998	2,0	2,4	2,3	2,4
1999	2,0	2,6	2,6	2,4
2000	3,1	3,7	3,3	3,3
2001	2,7	2,8	3,1	3,1
2002	0,8	1,1	1,2	1,1
2003	1,9	2,0	2,2	2,1
2004	0,6	1,2	0,8	1,0
2005	1,5	1,9	2,0	1,9
2006	2,5	3,3	3,1	3,3
2007	0,7	1,6	1,5	0,9
Average	1,85	2,34	2,25	2,21

Figure 9. HICP excluding OOH, HICP including House Price Index and HICP including Price Index of New Detached and Multi-Dwelling Houses. Annual growth rate. 1997-2007



The effect from including the OOH in the HICP is smaller on a quarterly basis. The House Price Index as a measure for OOH gives the largest quarterly difference between the official HICP and the HICP including OOH with a maximum deviation of 0.6 percentage points. The average quarterly growth rate in the HICP excluding OOH is 0.5 per cent from 1996 to 2007, while the average quarterly growth rate for the HICP including the House Price Index and the HICP including the Price Index of New Detached and Multi-Dwelling Houses is 0.6 per cent.

<sup>7</sup> The corrected version means that the prices of new detached houses are reversed by one year. The annual average of 2007 is based on monthly indices up to September 2007 in this series.



## **7. Concluding remarks**

In this paper we have analysed the effects of implementing the OOH in the Norwegian HICP using the net acquisition approach. This implies a strong weight reduction for OOH compared to the weight in the Norwegian CPI based on the rental equivalence principle. The National Accounts is chosen as the most appropriate source for deriving the weights. The National Accounts is also recommended as the most adequate weight source in the Technical Manual on OOH and for HICP in general. The Residential Fixed Capital Formation concept in the National Accounts is closely connected to the net acquisition principles.

Today none of the existing Norwegian house price indices fulfil the HICP provisional guidelines. The index most consistent with the recommendation seems to be the House Price Index. We recognise the strong effect land prices might have on the housing prices. Due to difficulties separating the land and the structure a “net weight, gross price” approach might be a good proxy solution in Statistics Norway.

The implementation of the OOH makes a strong impact on the Norwegian all-item HICP index. The OOH represented by the House Price Index pulls the Norwegian all-item index up, on average, by approximately 0.5 percentage points on a yearly basis during the period 1996-2007. The period in question is characterised by a very sharp increase in housing prices and at the end of the period the impact is even greater, up to a maximum of 0.9 percentage points on a yearly basis. The different OOH alternatives show however minor deviations in the overall period 1996-2007.



## **Annex**

Annex 1. "The ideal index"

Annex 2. Summary of the price indices for the Norwegian housing market

Annex 3. HICP excluding OOH and HICP including different OOH alternatives. 1996-2007. Index 1996=100

## **References**

Eurostat (2009): "Technical Manual on OOH for Harmonised Index of Consumer Prices", version 1.8

Christensen, Eide and Thomassen (2006): "Prisindeks for nye flerbolighus", Rapport 2006/2

Thomassen (2007): "Price index for new multi-dwelling houses. Sources and methods". Documents 2007/9

Official Statistics of Norway (D363): "Prisindekser for bygg og anlegg, bolig og eiendom 2006"

Official Statistics of Norway (D336): "Byggearealstatistikk 2004"

## **Statistical sources:**

Norwegian Association of Real Estate agents,  
<http://www.nef.no/index.gan?id=1534&subid=0>

Statistics Norway: "House Price Index",  
[http://www.ssb.no/english/subjects/08/02/30/bpi\\_en/](http://www.ssb.no/english/subjects/08/02/30/bpi_en/)

Statistics Norway: "Price Index of New Detached Houses",  
[http://www.ssb.no/english/subjects/08/02/30/enebolig\\_en/](http://www.ssb.no/english/subjects/08/02/30/enebolig_en/)

Statistics Norway: "Price Index of New Multi-Dwelling Houses",  
[http://www.ssb.no/english/subjects/08/02/30/flerbolig\\_en/](http://www.ssb.no/english/subjects/08/02/30/flerbolig_en/)

Statistics Norway: "Building statistics"  
[http://www.ssb.no/english/subjects/10/09/byggeareal\\_en/](http://www.ssb.no/english/subjects/10/09/byggeareal_en/)





### Annex 1. "The ideal index"

	Desired target	Observations and remarks
<b>Definition and aim of the index</b>	Provide a measure of price inflation for the household sector as a whole. Index measuring Household Final Monetary Consumption Expenditures	Index chained annually with December or the fourth quarter as the link period (see "base period" below)
<b>Geographical coverage</b>	All country	-
<b>Weight concept</b>	Value of transactions	Index weights should reflect the value of the additions to the stock of owner-occupied dwellings that was available to households in the base period
<b>Used prices</b>	Monetary transactions between the household sector and other institutional sectors	Real market transactions. No imputations or stated guesses/estimates. Full acquisition price
<b>relevant price concept</b>	Covering all relevant transactions	-
<b>sources</b>	Price at the time of the first (binding) contract	-
<b>timing</b>		
<b>Treatment of land prices</b>	Excluded	This exclusion is made on the grounds that the cost of land grasps the investment element and the cost of structure represents the consumption motivation of purchasing a dwelling
<b>Adjustment for quality change</b>	Indices unaffected by changes in the quality of the dwellings	The quality issue in the OOH/HICP context has much to do with changes in the compositional basket of available transactions
<b>Periodicity</b>	Monthly	Quarterly indices may be regarded as a suitable "second-best" solution
<b>Base period:</b>	one to three years	The choice should be made in accordance with the volatility of the net transactions of the base period
<b>for the weights</b>	Base 100 = 2005	The same as the HICP
<b>for the index</b>	December of each year	In the case of a quarterly index, the fourth quarter should be used
<b>for the prices</b>		
<b>Reliability</b>	Unbiased results	-
<b>Publication of results</b>	With a month of delay in relation to the reference period	The same as the HICP

Source: Technical Manual on OOH for HICP, Eurostat



**Annex 2. Summary of the price indices for the Norwegian housing market**

Variables	Price Index of New Detached Houses	Price Index of New Multi-Dwelling Houses	House Price Index
Definition and aim of the index	To measure the development in the construction cost or the producer price for new detached houses	To measure the development in the construction cost for new multi-dwelling houses. In practice the index is close to a selling price index	To measure the development in the selling price for all dwellings
Periodicity	Quarterly	Twice a year	Quarterly
Publication of results	Publishes about 3 months after the end of the reference period	Publishes about 4 weeks after the end of the reference period	Publishes 3-4 weeks after the end of the reference period
Availability	Back to 1989	Back to 2000	Back to 1991
Population/sampling	Complete census	All multi-dwelling house projects granted loans by the Norwegian State Housing Bank. The Bank's share of the total market is about 50%	The population consists of dwellings sold on the open market during the quarter in question, mostly second-hand dwellings.
Geographical coverage	All country	All country	All country
Data sources	Two different sources; Administrative Register and questionnaires. The register provides information on dwellings completed during the reference period; location, utility floor space and who the owner is. Quarterly questionnaires provide information about prices and quality characteristics that may have an influence on the price	Administrative Register information from the Norwegian State Housing Bank	Statistics Norway receives data from FINN.no in cooperation with the Norwegian Association of Real Estate Agents and the Association of Real Estate Undertakings. FINN.no cooperates with the largest real estate agencies in Norway. The Norwegian Federation of Cooperative Housing Associations provides data for cooperative housing
Price concept	The price the investor (final owner) has to pay for a new detached house excluding costs such as connection to road, water and sewer services, duties and administrative fees, and interest on building loans. VAT included	The price the final owner has to pay for a dwelling in a new multi-dwelling house. Costs such as connection to road, water and sewer services, duties and administrative fees, interest on building loans, client profits and VAT are included in the price. The price is based on the loan applications which is estimated costs and not the final transaction price	The registered purchase price of the dwelling. For cooperative dwellings, both the deposit and joint debt are included in the price



**Annex 2. continues**

<b>Variables</b>	<b>Price Index of New Detached Houses</b>	<b>Price Index of New Multi-Dwelling Houses</b>	<b>House Price Index</b>
Treatment of land prices	Excluded	Excluded	Included
Timing	The price is connected to the quarter in which the municipalities register the construction work as completed	Price at the time when the loan applications are accepted, usually when the building work commences during a six month period	Price at the time of the first binding contract
Calculation	Hedonic method. Linear regression with price per square metre as dependent variable. The variables used in the regression analysis correspond to characteristics that influence the price of detached houses. These comprise: utility floor space, geographic location, number of bathrooms, number of WCs, number of fireplaces, different types of self-built works, category of housing loan, ground site quality, ventilation and heating systems, sauna, roofing, terrace and central vacuum cleaner	Hedonic method, log linear regression. Variables used are utility floor space, geographical location, number of dwellings in the project, and the proportion of dwellings with energy economizing qualities in the project	Freeholder dwellings are calculated using the hedonic method. Log linear regression method using the variables size and area. Co-operative dwellings are calculated by using the simple average of square metre prices
Adjustment for quality change	Corrections for size and area as well as different dwelling characteristics	Corrections for size and area, but not housing standard	Corrections for size and area, but not housing standard



**Annex 3. HICP excluding OOH and HICP including different OOH alternatives. 1996-2007.  
Index 1996=100**

	HICP excl. OOH	HICP incl. House Price Index	HICP incl. Price Index of New Detached and Multi- Dwelling Houses	HICP incl. Price Index of New Detached Houses and Multi- Dwelling Houses, corrected
1996Q1	99	98,7	99	98,8
1996Q2	99,8	99,8	99,8	99,8
1996Q3	100,3	100,4	100,3	100,4
1996Q4	100,9	101,1	100,9	101
1997Q1	102,1	102,4	102,1	102,3
1997Q2	102,5	103,1	102,6	102,8
1997Q3	102,4	103	102,6	102,9
1997Q4	102,9	103,6	103,2	103,5
1998Q1	103,8	104,7	104,1	104,4
1998Q2	104,3	105,5	104,8	105,2
1998Q3	104,5	105,6	105,2	105,3
1998Q4	105	106	105,7	105,9
1999Q1	106	107	106,7	106,8
1999Q2	106,7	108,2	107,6	107,9
1999Q3	106,4	108	107,3	107,5
1999Q4	107,8	109,6	108,7	109
2000Q1	108,8	111	109,8	110,1
2000Q2	109,8	112,4	111,2	111,3
2000Q3	110,1	112,4	111,3	111,6
2000Q4	110,9	113,2	112,3	112,4
2001Q1	112,5	114,9	114	114,2
2001Q2	113,9	116,6	115,5	115,7
2001Q3	112,4	115,1	114,2	114,4
2001Q4	112,7	115,3	114,6	114,7
2002Q1	113,2	116	115,2	115,3
2002Q2	113,6	116,7	115,7	115,8
2002Q3	113,6	116,5	115,9	115,9
2002Q4	114,8	117,6	117	117
2003Q1	117,5	120,3	119,6	119,6
2003Q2	115,8	118,8	118,1	118,1
2003Q3	115,3	118,3	117,8	117,9
2003Q4	115,7	118,7	118,2	118,2
2004Q1	116,1	119,7	118,8	118,9
2004Q2	116,9	120,6	119,6	119,7
2004Q3	116,8	120,5	119,5	119,7
2004Q4	117,2	121	119,9	120,2
2005Q1	117,2	121,4	120,3	120,4
2005Q2	118,5	122,9	121,8	121,9
2005Q3	118,8	123,1	122,4	122,5
2005Q4	119,5	123,8	123	123,1
2006Q1	119,9	124,8	124	124,3
2006Q2	121,5	126,9	125,7	125,9
2006Q3	121,7	127,2	126,1	126,3
2006Q4	122,6	128,4	126,9	127,4
2007Q1	121,2	127,7	126	126,2
2007Q2	122,2	129	127	127,2
2007Q3	122,1	128,8	127,5	127,8
2007Q4	123,7	130,2	129,2	..