Chapter 9
OWNER OCCUPIED HOUSING IN THE ICELANDIC CPI

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1.   The Icelandic CPI House Price Index

The house price index used in the Icelandic CPI is based on actual property transaction prices: sales contracts from the Land Registry. Almost every concluded real estate agreement is obtained. It is not only in the interest of buyers that a contract is registered but also a condition for credit services from the Housing Financing Fund and the commercial banks. About 8,000-10,000 real estate sales contracts are closed annually, which represents about 8-10 percent of all the housing in the country. Every sales contract contains standardized information on the property, its owner(s) and the sales price.

A sales contract also includes payment arrangement details; this information is then used for computing the present value of the sales contract. The basic reason for applying the present value is the fact that the value of money paid today is different from the value of money paid in the future. The Icelandic housing price index is computed from changes in the present value of real estate sales and the price changes for real estate are calculated as a three-month moving average, with a one-month delay. For example, the index result in May is based on prices collected in the period of February through April. A stratification method is used in the compilation. The classifications used for this stratification are size, property type and location. The estimator used in the calculation is geometric and the index is calculated superlatively (using the Fisher index, in this case).

2.   Simple User Cost Method for Dealing with Owner Occupied Housing in a CPI

According to the household expenditures survey, about 80 percent of Icelanders live in owner occupied housing (OOH). The rental equivalence approach cannot be used to estimate changes in the cost of OOH because of the small size of the rental market. Instead, the imputed rent is computed as an annuity based on the average house value collected in the Household Expenditure Survey (HES), real interest rates and depreciation.

In Iceland, the approach of calculating housing cost as a simple user cost was adopted in November 1992.[2] To begin with, price measurements for housing covered only the capital city area. Since April 2000, however, they were extended to cover the whole country. The user cost method converts a part of the expenditure on a durable (such as a house) into a flow of services by taking into consideration the use of capital, the long term financial (opportunity) cost (interest), and the use of the durable (depreciation). With the full user cost approach, capital gains income is also subtracted.[3] This practice is natural in the case of firms as a part of measuring their profit, but there is disagreement regarding the appropriateness of doing this for households.

Conceptually, the Icelandic CPI measures price changes in household expenditures exclusive of changes in households' income. The stated aim is to measure changes in the price level of expenditures without regard for the amount of money needed or available to pay for the expenditures. Hence, capital gains are not taken into account. The real interest is taken to be the required return on (or opportunity cost of) capital tied up in the property or taken on credit. The long term real interest used in the calculation is intended to reflect a real return on the investment over the lifetime of the dwelling. In this respect, the real rate measures the capital gain. In the short run, the capital gain can be lower or higher than the rate of return, but it is approximated by the average long term real interest rate.

The fact that a part of the price of using capital is due to factors other than the service price for money makes the use of interest rates a quality adjustment issue. In order to determine the real interest rate, nominal interest rates must be adjusted for quality according to changes in inflation. Nominal interest rates reflect inflation, as well as risk and expectations; the higher the inflation, the higher the interest rates are.

When consumers buy property, they finance it with equity and mortgages and the average long term real interest rate in the model takes into account these two main types of financing. In the simple user cost model, the division between these two forms of finance is mainly based on information from the sales contracts used for house price measurement. As a result, the opportunity financial cost covering the lifetime of the durable is estimated by keeping the equity rate fixed but allowing the mortgage real interest share to vary. The required return on equity was determined in accordance with the long term rate of return that pension funds require. When this approach was adopted, this rate of return was 3 percent. That rate was adopted and retained.

Long term loans from the Housing Financing Fund were revamped in July 2004 and mortgage interest rates were lowered. Soon after that, commercial and savings banks greatly increased their housing loans at competitive interest rates. The initial fall in mortgage rates was included in the Icelandic CPI in July. However, as of August 2004 it was decided that the variable real mortgage rates, used in the calculation of the simple user cost of housing, should be calculated as a 60 month moving average. This decision was made in anticipation of frequent mortgage rate changes which might give rise to month-to-month volatility in the CPI.

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[2] A similar user cost approach was adapted by the National Economic Institute just after 1980, when inflation was high in Iceland, to measure the profitability of domestic fishing and fish processing.

[3] Research into the use of the full user cost has been interpreted by some as showing that the results are likely to be very volatile. See Gillingham (1980 and 1983) and Garner and Verbrugge (2009). However, the interest rates used by these others are nominal, rather than real.

Subsequently, however, the feared volatility of real interest rates on housing credit did not materialize and the rates were stabilized at a substantially lower level than before. As of May 2005, Statistics Iceland decided to change the method of averaging real interest rates in the model for owner occupied housing in the CPI and a 60-month moving average was replaced by a 12 month moving average. This change led to a lowering of the Icelandic CPI. These procedures and rates are reconsidered regularly when the CPI is rebased in March each year.

The depreciation rate used in the user cost calculation was obtained mainly by considering the age of the housing stock. The value of the site and the building are not separated in the records on which the housing index is based. Thus, a mean depreciation is calculated for the building and site. The depreciation in the index is 1.25 percent of this real estate value.[4]

Given data for house prices, interest rates and depreciation, the formula for the annuity is:

$$(1) \qquad A_{HV} = P_H \left[\frac{r}{1-(1+r)^{-N}} \right].$$

where A_{HV} is the annuity based on the house value, P_H is the present value of the house (collected in the HES), r is the real interest rate, and N is the lifetime of the durable (a depreciation rate of 1.25 per cent is used based on an assumed lifetime of 80 years with no scrap value at the end).[5] The house value, P_H, is price updated monthly with the house price index.

The average real interest rate, measured monthly, has hovered around 4 percent since 1992, the lowest rate being 3.6 percent in 2005 and the highest being 4.3 in 2008. When changes in real interest occur, however, they have a direct effect on the annual payment. Increases in the average real interest rate, in the instance of a long lifetime, increase the annuity (the imputed rent) by just about the same ratio.

The real interest rate also influences the value of the property used as the base for calculating the annuity, as lower interest rates normally lead to higher house prices. In calculating the present values of the sale contracts, the loans with fixed interest rates are discounted by a rate of return reflecting the change in the real interest rate. A rise in the real interest rate lowers the present value of a property. This fact is in accordance with the economic reality that a higher real interest rate leads to less demand and lower prices for housing.

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[4] The 1.25 percent rate is stated to correspond roughly to a depreciation rate for structures of 1.5 percent with a lifetime of about 67 years.

[5] This user cost method is in some ways similar to Steiner (1961) suggestion in the Stigler report. In the Steiner user cost model the annuity method is used to measure depreciation and interest but real interest rates are not used.

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