



**HOUSEHOLD SATELLITE ACCOUNT
(EXPERIMENTAL)
METHODOLOGY
Chapter 10 Household Capital**

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April 2002

10. HOUSEHOLD CAPITAL

Concepts

In order to measure the contribution of household capital to the output of household production, we need an estimate of the value of the services they provide. In the absence of information on rental prices and stocks, we can use National Accounts data on expenditure and a perpetual inventory model (PIM) to estimate the value of capital consumption, as a proxy for the value of capital services. Consumption of fixed capital is the decline, during an accounting period, in the current replacement value of the assets used by producers, as a result of deterioration, obsolescence and accidental damage.

In order to identify household capital, we have used the COICOP classification of household final consumption expenditure, and taken only those items which are classed as durables. Semi-durables (household textiles, glass and crystal-ware, cutlery, kitchen utensils, small tools etc.) while they may last for as many years as durables, are generally items of less value. Estimates of their life lengths are almost impossible to come by, as they are more likely to be replaced for reasons of changing fashion and taste. They are therefore included in the HHSA as intermediate consumption.

Methodology

Data sources

The National Accounts estimates of consumption of household durables, at the four-digit COICOP classification level, do not, on their own, provide sufficient detail to develop a perpetual inventory model for HHSA purposes. This is because asset life lengths vary within a category such as major household appliances, and this category has to be split between several principal functions.

Market research information on the value of purchases of specific white goods is available from Mintel, and this has been compared with detailed data from the Family Expenditure Survey, in order to disaggregate the National Accounts data.

Volume data

The data required for the PIM are constant price expenditure at the appropriate level of detail, average asset life lengths, a mortality function which describes how assets are retired around the average, a depreciation formula and deflators to allow the capital consumption to be reflated to current prices.

The expenditure series are available from 1963 onwards and most can be allocated in their entirety to a principal function. These are assumed to relate to groups of assets with the same average asset life. As mentioned above, a combination of Mintel and FES data has been used to divide major household appliances between the various types of asset. The COICOP series for motor cars includes dealers' margins on second hand car sales and estimates of cars in kind, both of which, for the purposes of estimating the capital stock and consumption, must be excluded. Data on private registrations (new cars), dealers' margins and second hand cars is currently available only from 1986. This has been used to estimate a constant proportion of expenditure on new and second hand cars for years prior to 1986.

Information on asset service life lengths of white goods has been collected by the E-SCOPE study (Electronics industry – Social Considerations Of Product End-of-Life), investigating

the purchase, use and disposal of household appliances in the UK. Estimates of average life lengths for furnishings, carpets and bicycles have been taken from the Eurostat working paper. Average life lengths for new and second hand cars and for motorcycles were obtained from the DVLA – these are different from the life length of business vehicles used in the National Accounts, because we are assuming different patterns of usage by households and businesses. Table 10.1 below shows the percentages of the National Accounts series and the asset life lengths which have been used.

Table 10.1 Household capital volume series

COICOP classification	Description	Divided into:	% split	Principal function	Asset life length
05.1.1	Furniture & furnishings		100	Housing	*15
05.1.2	Carpets etc.		100	Housing	*10
05.3.1	Major HH appliances	Cookers	20	Nutrition	12
		Microwaves	5	Nutrition	7
		Fridges & freezers	20	Nutrition	11
		Dishwashers	5	Nutrition	9
		Washing machines & driers	23	Clothing	9
		Fires, showers, vacuum cleaners etc.	27	Housing	8
05.5.1	Major tools & equipment		100	Housing	7
07.1.1	Motor cars	New	52	Transport	†13
		Second hand	27	Transport	†11
07.1.2	Motor cycles		100	Transport	†10
07.1.3	Bicycles		100	Transport	*9

Source: Percentage split: HHSA estimates based on FES, Mintel and National Accounts data

Note: Cars do not add up to 100 per cent of the series because cars in kind, and dealers' margins on second hand cars have been excluded

Asset life lengths: * Eurostat working paper

† DVLA

all others – E-Scope Study

The PIM model

The Perpetual Inventory Method (PIM) used by the UK National Accounts conforms to international standards, with small variations. The procedure is to estimate the gross capital stock, to apply a depreciation function to calculate consumption of fixed capital and obtain net capital stock by subtracting accumulated capital consumption from the gross capital stock. To do this, the PIM uses data on purchases and sales of fixed assets and assumptions about their life lengths, retirement distribution and depreciation.

A retirement function is used to model the distribution of life-lengths modelling retirement as a process over time, rather than a discontinuous termination. The present UK methodology uses the normal distribution, that is, assets are assumed to retire according to this distribution either side of the average length of life for the group. The PIM also makes assumptions on spread of life lengths. For HHSA purposes we have used the shorter of the two spreads used in the National Accounts calculation – retirements are spread over 10 years either side of the average asset life. The National Accounts model uses three default coefficients of variation (CV: standard deviation/mean) in the retirement function. We have used the CV for vehicles (0.06) for cars, motor cycles and bikes, and the CV for plant (0.209) for all other household capital. Because we are applying the model to households and using data series from 1963 onwards, we have removed the adjustments for bankruptcy and war scrapping.

The model requires an assumption about how assets should depreciated. In part reflecting simplicity and part wider convention, the straight-line method is used throughout the calculation in the UK National Accounts, and we have also used this in the HHSAs.

Sensitivity analysis

Calculations using a PIM are very sensitive to assumptions about asset life lengths, and we tested the impact on our estimates of varying the life lengths. We also looked at the impact of using a geometric function for depreciation. Using a model developed by Rormose & Mollgaard, we also calculated capital services. This involved calculating the consumption of fixed capital indirectly, using an age-price function to estimate the net capital stock at constant prices, based on a one-hoss shay age-efficiency profile. This assumes that items of capital equipment yield the same volume of services every year until they retire. The value of capital services is equal to capital consumption plus foregone income, and is therefore particularly sensitive to the discount rate used.