CES/AC.49/41
17 September 1993

Original: ENGLISH

STATISTICAL COMMISSION and ECONOMIC COMMISSION FOR EUROPE

INTERNATIONAL LABOUR ORGANIZATION

CONFERENCE OF EUROPEAN STATISTICIANS

Joint ECE/ILO Meeting on consumer price indices
(Geneva, 25-28 October 1993)

THE TREATMENT OF NON-MARKET GOODS IN CPI:

OWNER-OCCUPIED HOUSING

Paper by the United Kingdom

Summary

1. This paper looks at owner-occupiers' housing costs in the context of the uses of the CPI, both international and domestic; outlines the methodological options; and presents arguments for and against each. The treatment of subsidies provided through direct taxation and problems with the use of hedonic regression methods are also addressed. A list of possible points for discussion is given at the end.

Introduction

2. Owner-occupied housing is not necessarily a topic to be considered when examining the treatment of non-market goods in the CPI. Clearly housing is a market good; houses are bought and sold. The question to be addressed is whether the continuing shelter provided by housing should be priced for inclusion in the CPI and, if so, how. Other housing expenditure components, such as repairs, heating and lighting, can readily be included in the CPI in the same way as other consumer goods and services and are not discussed further in this paper.

3. There are at least three angles from which the problem may be viewed:

- the uses and users of the index;
- the methodological options;
- the practicalities of construction.

4. The methodological options are those generally applicable for constructing a price index. They are:

- acquisition - the cost of acquiring goods and services
- use - the cost of using goods and services

- payments - the actual cash outlays involved in acquiring or consuming goods and services.

For most goods and services covered by the consumer prices index (CPI) there is little difference between the three bases and, in the United Kingdom at least, the acquisition basis is used. For housing the three bases suggest quite different approaches with different measures and different implications for users. These are discussed below, with the practical issues and likely objections.

International considerations

5. Within the European Community there is increasing emphasis on the use of the CPI as a general measure of inflation, particularly with a view to determining convergence of member countries' economies. However, at present, there is no agreement on the precise method for compiling the CPI for this purpose. More generally, because of the marked differences in the operation of the housing markets in different countries, the International Labour Organisation (ILO) recommended that countries produce a price index to facilitate international comparison which excludes housing. There is no specific ILO guidance on what constitutes housing, and what should therefore be excluded to provide a satisfactory basis for comparison, but investment is generally to be excluded from the CPI.

Uses of the CPI

6. The purpose of the CPI is to measure changes over time in the general level of prices of goods and services that the reference population acquires, uses or pays for consumption. The uses to which the CPI is put and the users of the CPI vary. The relative importance of the various uses should be a key factor in assessing the various options for taking account of housing costs in the construction of the index. Of course, other factors need to be considered, including the practicability of any approach, the costs associated with the collection of additional/different data and how well the resulting index is likely to be understood by users.

7. The main uses of the index may be summarised under three broad headings:
income adjustment
measurement of inflation
and price adjustment

Income adjustment uses include:
- indexation of taxes, incomes and benefits;
- deflation of wages, salaries and other incomes and of expenditure.

Measurement of inflation involves considerations such as:
- general economic and social analysis, and policy determination;
- assessing the internal purchasing power of the currency;
- international comparisons.

Price adjustment uses include those linked to:
- contractual arrangements, particularly for goods and services;
- control of certain industries' prices;
- investments.

8. It is perhaps worth considering for each of these uses what would be the most appropriate way to treat owner-occupied housing costs. For example, it could be argued that the use of the CPI as a general measure of inflation is very important as, in some countries, increasing use is made of it for this purpose. It may simultaneously be seen as a measure of the effectiveness of government economic policy. If the main use of the CPI is to measure inflation, it could be argued that a general price index covering capital goods, exports and purchases by government, as well as consumer items would be better than one limited to consumer items. Perhaps, imputed items would be best omitted as inflation is generally viewed as being related to current market transactions. That points away from a user-cost-based index, which includes imputations - see below. Further, as changes in prices and interest rates have different causes and effects, it may therefore be wise not to include interest rates in an index used as a general measure of inflation. This points away from payments and towards an acquisition type index.

9. Similarly, it could be argued that the use of the CPI for indexation (wage and salary adjustment) purposes is also very significant, and its use for this over time has made the CPI such an important indicator. However, if the main use of the CPI was for indexation/wage and salary adjustment purposes, possibly the index should relate only to the target population, for example, pensioners or wage and salary earners, and to the goods and services being purchased, for example, consumer items. In this context one is led to a payments index which, for owner-occupied housing costs, is quite different from an acquisition index. Also, if the use is predominantly for income adjustment, because actual income does not include imputed items, the CPI should not include them either.

10. However, there are various objections to using a payments basis for owner-occupiers’ housing costs:

- many users, especially economists, consider the method is not (even in principle) appropriate as a measure of housing costs. The inclusion of interest rates in an index measuring inflation gives perverse results (see OECD comment, below);

- developments in housing finance have been so far reaching as to change the connection between housing and mortgage finance in some countries such as the United Kingdom;

- mortgage interest payments could be seen as measuring the cost of credit and not all countries necessarily include other credit charges in the CPI;

- mortgage interest payments, in some countries, are the means of producing a major element of investment; and borrowers have generally not only enjoyed the shelter of their properties but ended up with a capital asset far exceeding the sum of the principal repayments made (which are themselves excluded from the CPI weighting).

The OECD commented on the United Kingdom’s Retail Prices Index (RPI, its equivalent of the CPI) that,

"The inclusion of mortgage interest payments is logical if the index purports to reflect 'cost of living', but the logic is unclear if the index is one measuring retail prices, as nominal interest rates also include an element of prepayment of capital for expected inflation. ... Present treatment of mortgage interest payments introduces unnecessary short-term volatility into the RPI and affects the short-run efficacy of anti-inflationary monetary policy - as higher interest rates have a quick perverse effect. When the government acts to control inflation the index simply indicates that those actions have made matters worse - higher interest rates push up the RPI and hence tend to push up wages."

Methodological options for measuring owner-occupiers' housing costs

- Acquisition

11. The acquisition approach relates to the value of market transactions in acquiring property. Acquisitions can be measured on a gross basis or net of sales. Purchases can be of either new or existing houses. For existing houses most purchases coincide with a sale; so acquisitions net of sales relate primarily to the price of new housing. In practice, unless housing is to have a very large weight in the CPI, the acquisition approach uses net transactions. It attempts to measure the change in the purchase value of a sample of new owner-occupied housing similar to the new owner-occupied dwellings acquired in the base reference period. It uses the value of market acquisitions of dwellings for owner-occupation, taking the change through time in the purchase price of net additions to the stock of owner-occupied housing. The weight in the total CPI would be the value of additions to the stock in the base period and the price indicator for owner-occupied housing would be an index of new house prices adjusted to remove changes in quality (particularly a different "mix" of housing types) over time.

12. This assumes, for simplicity, that net sales to and from the non-household part of the economy are zero. That would not be the case when purchases by the reference population, consumers, correspond to sales by local government or businesses, and appropriate modifications to the methodology would be required to include them.

13. The main objection to the acquisitions approach is that it involves introducing into the CPI an item regarded in many countries as an investment, and this contravenes current ILO guidelines on CPI construction.

14. Advantages:

- fairly straightforward in concept;
- for countries which treat other large consumer durables as outright purchases in the CPI, even if they are financed on credit, the method provides consistency of treatment for owner-occupied dwellings;
- information on house prices by type of structure is generally fairly readily available.

15. Disadvantages:

- it does not measure the cost of consumption, which some economic analysts and national accountants favour;

- quality changes in housing are difficult to measure;
- house prices can be volatile;
- it contravenes ILO guidelines on investment;
- it is little used in practice, so unsuitable for international comparisons.

- Use

16. This measures the cost of using owner-occupied dwellings, estimating the opportunity cost of housing in one of three ways. One is to treat it as the rent the owner, as tenant, notionally pays to himself, as occupier - the rental equivalent approach. The second is to treat it as the income foregone by tying up capital in the house - the opportunity cost approach. The third is to treat it in accounting terms, considering interest and depreciation charges - the accounting approach.

-- Rental equivalent approach

The first monitors the equivalent rent that the property would command (alternatively seen as the expenditure saved by not renting a similar property). The CPI would measure the change in the estimated rental value of owner-occupied dwellings similar to those dwellings notionally rented in the reference period. The weight would be the average equivalent rent for owned houses in the base period, imputed on the basis of actual rents for private rented dwellings, adjusted to allow for quality differences between owned and rented housing. The price indicator would be an index based on an appropriately stratified and weighted sample of private rents.

17. Imputed rent is difficult to operate where there is a small and/or different private rental market for comparison. In the United Kingdom, recent expansion of the rental market has not been sufficient to solve that problem. Some work has been done on using hedonic regression methods to estimate relationships between rents, housing characteristics and house prices, but it has been difficult to draw any satisfactory conclusions. This work is discussed further below.

18. Advantages:

- attempts to measure the cost of consumption of housing;
- consistent with national accounts treatment, which may be desirable for those countries which use national accounts consumers’ expenditure data for CPI weighting;
- a number of countries use it.

19. Disadvantages:

- rental information covers only a small market in many countries and rented housing may be different from owner-occupied housing;
- an increase in imputed rent has no effect on cash outlays, which may be the most important consideration for public acceptability of the index;
- imputed rent for the base period may give owner-occupiers’ housing a much larger weight in the CPI than it would have otherwise. Is it appropriate for the CPI be calculated using notional items

which have a weight of perhaps one-quarter to one-third of the index?

- remote from owner-occupiers' actual experience.

-- Opportunity cost approach

20. The second version of the user cost approach involves estimating the opportunity cost incurred in tying up capital in bricks and mortar (net of any capital gains from appreciation) rather than investing in some other (financial) asset. It is based on measuring the price of the flow of services which the home owner receives from the asset. The CPI would measure the change in the opportunity cost of the invested capital value, plus depreciation less capital gains for owner-occupied dwellings similar to those dwellings owned in the reference period.

21. The standard treatment is to define user cost as:

$$C = D - K + i\,M + r\,E + Z$$

D - Depreciation K - Capital Gain/Loss
M - Mortgage balance owed E - Owner equity in house
i - mortgage interest rate paid r - interest rate foregone on equity
Z - operating costs (repairs and maintenance etc)

Both the weight and the price indicator would be based on:
a rate of return on capital
less the appreciation in house prices
plus the cost of servicing mortgages
plus depreciation and transactions costs.

22. Such a measure of user cost involves fairly arbitrary assumptions, particularly about alternative investments and the appropriate rates of return to be adopted. Like the acquisitions method, it involves using current house prices.

23. Advantages:

- it attempts to measure the consumption cost of housing.

24. Disadvantages:

- conceptually difficult to understand;
- measurement of some items presents difficulties, especially the interest rate foregone on equity, which may give negative values;
- it does not relate to actual expenditure;
- it is used by very few countries.

-- Accounting approach

25. This is closely linked to the payments approach as it incorporates an element for mortgage interest payments which would be compiled as outlined in the next section. The advantages and disadvantages of using mortgage interest are given in the next section. In addition it includes depreciation at current replacement cost. Both are measured for a sample of owner-occupied dwellings as near identical as possible to those covered in the reference

period. The use of depreciation raises a number of practical problems of measurement, in particular, the length of life to be assumed for the dwelling, which affects the rate of depreciation. Measurement of the current replacement value of the housing in the sample may not be straightforward either, particularly if it is difficult to separate building prices from land costs. Both these problems affect the weight. The price indicator to be used would be a price index of all dwellings, excluding land. This too may be difficult to compile.

26. Advantages:

- attempts to measure the cost of living in a dwelling;
- readily understood, by accountants at least.

27. Disadvantages:

- depreciation data, both weight and price indicator, difficult to collect/estimate;
- mortgage interest payments - see payments, below.

- Payments

28. This approach usually measures the changes in cash outlays on interest on mortgage or other loans for the purchase of owner-occupied dwellings similar to those dwellings occupied in the reference period. It involves estimating the payments made by owner-occupiers, measuring expenditure actually incurred in order to occupy the house. Capital repayments and down payment on purchases are usually excluded as they are regarded as investment which, under international recommendations, is excluded from the CPI.

29. This approach may seem simple but the methodology is by no means obvious, since actual payments can depend on the kind of financial arrangement adopted. It is not easy to distinguish measurement of housing costs from financing costs. It is necessary to estimate the current interest payments on owner-occupied dwellings providing the same shelter as those in the reference period. For practical purposes, this may be interpreted in a variety of ways; for example, as payments on dwellings for which the same proportion of the purchase price was borrowed and with the same age-distribution of mortgages outstanding as those in the reference period. The precise methodology has to be adapted to reflect the financing arrangements for house purchase in each country.

30. Advantages:

- conceptually simple and based on actual, observable, cash payments;
- relatively easy to measure;
- relates to what householders think of as being their current expenditure on housing.

31. Disadvantages:

- it may measure financing costs, not housing costs;
- owner-occupiers without mortgages are treated as having no shelter costs unless mortgage payments are imputed to them;

- some mortgage finance may be used to finance purchases other than housing;
- not used by many countries.

32. It has been suggested that the payments approach raises questions as to whether nominal or real interest rates are the appropriate price indicator. Nominal rates are generally used as these seem the only measure relevant to cash outlays. However, it has been argued that "real" interest rates would be more appropriate since allowance should be made for the erosion of the value of the debt when house prices are rising. This glosses over the practical problems of measuring real interest rates satisfactorily and the further difficulty of explaining the concept to the general public concerned with measuring changes in their cost of living.

Other issues - subsidies

33. In many countries there is some form of government subsidy available to meet part of housing costs. In the United Kingdom, owner-occupiers are eligible for tax relief on interest payments on first mortgages up to a certain limit. However, this is a relief from income tax, ie a form of direct taxation, though eligibility is not related to size of income. Although it is provided directly to house owners through lenders, in the form of reduced interest payments, should it be reflected in payments recorded for CPI purposes? ILO guidelines indicate that direct taxes themselves should be excluded from the CPI, but the treatment of universally available price reductions through direct tax relief is less clear-cut.

34. Elsewhere within the housing components of the CPI, the United Kingdom has recently re-addressed the treatment of discounts and subsidies. The treatment of various forms of relief from payment of council tax (a local, indirect tax on housing) was considered. The eventual recommendation was that, with the sole exception of a particular transitional relief, all discounts and subsidies associated with the tax should be reflected in the RPI provided that they are not directly income-related.

35. The treatment of subsidies is also relevant in the context of housing rents, which may be subsidised in some countries, either directly or indirectly. If paid rents are to be used to impute rents to owner-occupiers in the CPI, should they be recorded before or after subsidy?

- hedonic regression methods

36. The United Kingdom has explored the possibility of using hedonic regression to impute rents to owner-occupied housing. The method involves estimating, by means of regression analysis of sample data, the contributions of a wide range of characteristics of rented property to rental values. Those values are then imputed to owner-occupied property with the same characteristics. While the method appears to have potential, in practice it requires very large sets of sample data for both rented and owned properties to make it possible to match characteristics of the two adequately.

37. In the United Kingdom, there is very little privately rented housing and even less that is broadly comparable with owner-occupied housing. In particular, many parts of the country have no such rented housing and it has

been established, not surprisingly, that location is a key explanatory variable in hedonic regression for housing. Imputation of rents to owner-occupied property using regression coefficients derived from relatively small samples of privately rented properties obtained for three years did not give stable results. It was felt that much more data would have been required before any valid conclusions might be drawn; and there was no guarantee that even larger samples would have produced satisfactory results, given the differences in the United Kingdom housing markets for owner-occupied and rented housing.

Conclusion

38. These conceptual and practical issues have no simple solutions appropriate in all contexts. Discussions between CPI compilers may, however, help to clarify the problems and suggest the best approach to be followed for particular purposes. It may be necessary to accept more than one version of the CPI for each country, with different treatments of housing according to the eventual use of the index.

Suggested discussion points

39. a. Have countries developed their treatment of owner-occupiers' housing costs in the CPI to meet specific uses? If so, what are those uses?

b. Can methodology appropriate for one use be adapted satisfactorily to meet other requirements? Is mixed methodology ever acceptable?

c. What are the objections to having more than one version of the CPI? What is the experience of countries which have more than one?

d. What practical problems have been encountered by compilers with
acquisitions,
user cost (three variants: rental equivalent, opportunity cost and accounting approach)
or payments approaches?
How have these been resolved?

e. How are subsidies treated in practice?

f. Have hedonic regression techniques proved successful, and if so, what are the minimum data requirements in practice?

REFERENCE:

"Consumer price indices. An ILO Manual"   Ralph Turvey et al