

CPI Housing Summary

The measurement of housing costs in the Consumer Price Index (CPI) has long been an area of controversy, both within the United States and internationally. In part, this reflects the large size of shelter expenses in the typical consumer budget that makes the accurate measurement of housing cost changes an important determinant of overall changes in the index. But it also reflects a conceptual disagreement about whether the CPI should be seek to measure changes in the costs of the products that a representative household consumes or should it focus on the household's expenditures. This issue is of particular relevance for measuring the costs associated with homeownership.

Under the consumption approach, home purchase is viewed as an investment and owners are treated as renting from themselves, using a notional concept of rental equivalence or a user cost framework in which the flow of services from an asset is measured as the sum of depreciation and a real interest rate (opportunity cost), less any price appreciation. The alternative of an expenditure approach rejects any notional measure in favor of actual expenditures, and poses the choice as between a measure of continuing outlays and the acquisition cost. The decision on which approach to use in constructing the CPI has a large affect on what is included in the market basket of items to be priced and their relative weights. In any period, for example, far more household will consume housing than will purchase it, yet the outlays of the few purchasers will be very large. One of the most controversial aspects of the debate involves the appropriate treatment of mortgage interest as a cost item. The distinction between the consumption and expenditure concepts can also be carried over to a consideration of the appropriate treatment of other durable goods.

The morning portion of the workshop examined both the conceptual issues and the complex survey issues that arise with efforts to accurately measure the change in housing costs within the CPI.

John Greenlees, BLS

Greenlee's presentation focused on the current treatment of housing costs in the U.S. CPI. Beginning in 1983, the United States has adopted a rental equivalence concept to measure the consumption costs of homeownership. Thus, the housing costs of homeowners are measured as equivalent to the rent that is charged on similar rental properties. Greenlees pointed out that the high incidence of homeownership results in a weight of 22 percent for the rental equivalence component in the CPI compared to only 6 percent for standard renters. The weight for the owner-occupied component is determined in the Consumer Expenditure Survey (CEX) by asking homeowners how much they thought their home would rent for. However, the actual monthly changes in the rent index are obtained from a longitudinal survey of rental-occupied units. The same rent index is use for both rental and owner-occupied units, with the modification that any utility costs are removed from the rent measure in applying it to the home-owner component. For units built before the last census, the BLS uses a stratified clustered sample that defines neighborhoods by rent level. Units built after the latest census are

identified from the annual construction survey. BLS also incorporates a hedonic estimate of the ageing effect (quality change between price observations on the same unit).¹

Prior to 1983, Greenlees interpreted the approach as reflecting an ad-hoc user cost framework that included home purchase, mortgage interest, maintenance, taxes and insurance. The result was a very large weight in the index, but a measure that was very sensitive to mortgage interest rates. BLS began to experiment with alternative measures that reflected the flow of consumption services (rental equivalence or user costs) or explicit outlays. They also investigated the use of a 5-year average of interest rates to reduce volatility in the indexes. Over the experimental period of 1978-80 the user cost variants in particular were very volatile. That volatility led the BLS to opt for the rental-equivalency approach, which was based on observed rents.

Greenlees reported that BLS was primarily concerned with the complexity and cost of the current process, and the difficulty identifying rental units and updating the sample on a continual basis. The current research effort is focused on improving the efficiency of the sampling process, perhaps by purchasing address lists from private vendors that would identify tenure. These lists would also be more current than relying on the decennial digest. In the future they might be able to make use of the new American Community Survey to update the sample.

Jack Triplett – Brookings

Triplett reported on the measures of housing costs that are incorporated in the Consumer Price Indexes of other countries. He highlighted the extreme variability in national practices, based on a survey of the mid-1990s. The first surprise was that many countries, including several in the EU, completely exclude owner-occupiers shelter costs from their official CPIs. For those who adopt a cost-of-living concept of the CPI, there are two options: (1) the rental equivalence approach used in the United States, and (2) the user cost, which computes the rental costs as the sum of the rate of depreciation, the real interest rate, and a capital gain term. However, the user cost framework is not commonly used because of objections to the inclusion of a market interest rate in the CPI. The user-cost measures tend to be highly variable, and actions of the monetary authorities to reduce CPI inflation will have the initial effect of increasing the reported rate. A substantial number of countries, including the United States, Japan, and Germany, use the rental equivalence approach.

Some countries have rejected the U.S. use of rental equivalence on the grounds that the characteristics of housing units in their rental market are much different than those that are owner-occupied. Rental units are often government-provided or government-subsidized. Thus, they argue that the market for owner-equivalent units is too thin. At the same time, the alternative of a user cost measure is often opposed by the countries' central bank. Thus, only New Zealand, among the industrial economies, uses the user cost approach. Having ruled out the two main variants of the cost-of-living approach, other countries are driven to focus on the expenditure approach, either the

¹ The rental equivalence framework of the CPI is similar to the treatment of homeownership in the national accounts. However, the share of rent in total consumption is much larger in the CPI. That does not reflect a larger estimate of the rental costs, but rather the CEX has a much lower estimate of other consumption expenditures.

acquisition costs of housing or out-of-pocket expenses. In most cases the resulting measures are very ad hoc in incorporating only a portion of the relevant costs.

In the discussion, Walter Oi questioned the inclusion of real estate taxes in the measure of housing costs since it viewed it as largely the price of education, not housing. Triplett responded that the tax was a cost of owning the home, and not directly the cost of education. Robert Gordon pointed out that, in that respect, the property tax was similar to the sales tax, which is included in the price of goods even though it is used to finance other government programs. Triplett observed that education was an issue because free government services are not typically included in the standard market basket of consumption items or domain of the CPI. The appropriate domain of the CPI was discussed in some detail in the recent report of a review panel of the National Research Council.

Kim Zieschang reported on an international working group's efforts to update the CPI manual of the ILO. See the report at

<http://www.ilo.org/public/english/bureau/stat/guides/cpi/>

They draw a strong distinction between the primary use of the CPI as a measure of inflation or consumption costs, and the choice between an expenditure or consumption framework. The Harmonized Indices of Consumer Prices (HICPs), used to measure inflation trends in the EU countries, for example, rule out any imputations for owner-occupied housing. Yet, the indexes do not cross the boundary between consumption and investment, and include a measure of home purchase. Thus they simply underweight housing costs. The working group was unable to make a choice among the options of housing as a service, a purchase, or its exclusion from the index.

David Lebow suggested that the exclusion of housing from the CPI might not be a bad compromise, even for the cost-of-living framework, because a rise in the price was both an increase in the cost of housing services and an income gain to the owner. Thus, for example, one would not want to compensate pensioners for an increase in the cost of their housing if they were the owner. Triplett saw that perspective as reflecting the need to measure both income and consumption accurately, and that ignoring the issue on one side was not a good adjustment for the failure to deal with it on the other. Randall Verrugge of BLS stressed the importance of distinguishing between a cost of living measure and the constant standard of living compensation. He pointed out that home price increases imply a gain to the owner, but a loss to potential buyers.

María Luengo-Prado

Luengo-Prado discussed her paper with Antonio Díaz on the determinants of housing tenure choice. They develop a model based on the user cost framework that seeks to explain the choice between renting and owning an home. They placed particular emphasis on the distortions introduced by the tax system and the effects of uncertainty and adjustment costs on tenure choice. Under most income tax systems homeownership is given a favorable tax treatment by the failure to subject the implicit rental income of the owner to taxation. That failing can be partially mitigated by denying the deduction of mortgage interest, but does not offset the favorable treatment for high-wealth individuals who can shift their investment portfolio from taxable assets to tax-exempt housing.

They calibrate their model to match the experience of the United States and experiment with variations in the various parameters with a scenario where they generate

shocks to income and housing prices. They find that home ownership is most sensitive to variations in the downpayment requirements, the degree of substitutability between rental and owner properties, and variations in a progressive tax system. Thus, their analysis suggests that renters tend to be people who have not yet accumulated a downpayment, face high adjustment costs because of frequent moves, or have a strong preference for current consumption.

In his discussion Robert Martin focused on the importance of transactions costs in limiting the frequency of moves. He derived an alternative user cost measure that incorporated transaction costs both for the renter/owners and a landlord, and argued that transactions costs are important and too often overlooked in considering the decision to move and to rent or purchase. Other participants asked whether it would be important to evaluate the transaction costs as fixed or proportionate to value. Luando-Prado argued that both versions would introduce a lumpiness that would reduce the frequency of moves. Some participants expressed concern about why a proportionate tax had so little effect on the home purchase decision, whereas a progressive tax made a large difference. Luando-Prado attributed it to the asymmetric response to the random shocks under the progressive tax.

Jonathan McCarthy and Richard Peach (New York Federal Reserve)

The authors summarized their paper which examines the performance of the housing component of the CPI over the decade of the 1990. They used the American Housing Survey to construct alternative indexes of the changes in rents and the rental equivalent measure for owner-occupied units. The two measures are comparable in the first half of the 1990s, but their indexes show somewhat greater rent inflation after 1995. They believe that this results because the BLS sample of rental units is thin at the upper portion of the distribution; yet, that is the segment with the largest changes in rents were occurring. Because home ownership is skewed toward the upper end of the distribution, the difficulty of measuring rent increases also had a more pronounced impact on the rental equivalent component. For the top-most portion of the distribution of home values there are very few equivalent rental units in the same neighborhood.

Leonard Nakamura (Philadelphia Federal Reserve)

Nakamura summarized a paper co-authored with Theodore Crone and Richard Voith that examined the historical record of measuring rent change in the CPI over the period of 1940 to 1997. During that period the CPI missed many of the changes in rents that occurred on the occasion of tenant changes. Yet, tenant changes tend to be an occasion for landlords to institute the largest rent increases. Furthermore, the BLS had not yet instituted its adjustments of quality change associated with the aging of a rental unit. Thus, they argue that the rent component of the CPI was biased downward during that period. They estimate the bias as being as large as 1.5 percent annually.

Prior to 1942, rental information was obtained from landlord records, and if a unit was temporarily vacant, a rent could easily be imputed. After 1942, BLS sought to obtain the information directly from tenants. This change led to a substantial increase in nonresponse. The authors develop model to measure the impact of nonresponse and parameterize it on the basis of information from housing surveys and internal BLS data.

In his discussion of the two papers, Robert Gordon emphasized the importance of examining sources of potential downward bias in the CPI, as was done with these studies, in comparison to the usual focus on sources of overstatement. He was particularly convinced by the Crone-Nakamura-Voith paper because they provided a very convincing argument about why the historical rent index would have been biased. He pointed to a puzzle, however, that the portion of their analysis that used repeated sampling on the same units reported a lower rate of price increase. He suggested that the problem may be related to the situation in apparel in which it was found that a matched-model measure of price change was also biased downward.

Gordon also compared the bias reported in the McCarthy-Peach paper that resulted from insufficient sampling at the top of the distribution to a earlier paper by Paul Piper that pointed to potential understatement of home price inflation that resulted from underreporting of the prices of the largest houses.. If he cumulated the annual data in the paper, he obtained an average annual bias in the 1990s of 0.4 percent for the rent component and 0.8 percent per year for the owner-occupied. He wished that the authors would extend their paper to cover a longer historical period. He added to their suggestion that the market for very expensive rental properties would be particularly limited because mostly wealthy individuals will opt to take advantage of the tax subsidy associated with home ownership.

The second discussant, Randal Vanbrugghe from BLS, emphasized that the Crone-Nakamura-Voith paper was focused on historical problems that had been recognized and corrected by BLS. It is perhaps unfortunate that BLS does not revise its official historical data, but many of the revisions are carried back in the research series. At present, they believe it would be very difficult to extend the research series back before 1978. He also suggested that the use of a fixed rate of turnover may yield a misleading certainty to the estimate of the magnitude of the nonresponse bias.

Vanbrugghe particularly liked the McCarthy-Peach paper because it used a different survey data set to develop an alternative price index to that of the BLS. However, he argued that the distribution of rents was really quite similar in the American Household survey and that used by the BLS, but the BLS sample was about twice as large. In addition, he was concerned that the AHS is truncated at the top of the distribution. He noted that McCarthy and Peach may no allowance for geography in their assignment of units to the various segments. BLS has found location to be a particularly important determinant of rent changes. However, they updated their weights more frequently, and he thought this was an area in which BLS could improve its methodology. He also agreed that it is hard to find matching rental units at the high end of the market. That might be another reason to reexamine the applicability of the user cost concept

In the general discussion Theodore Crone stressed the importance of being alert to reporting errors in the AHS data. Barry Bosworth pointed to the importance of liquidity constraints that lead people to qualify for much larger mortgages and thus purchase larger homes when interest rates go down. In the user cost framework this amplifies a natural inverse correlation between price appreciation and interest rate changes. It is difficult to obtain measures of the two components that don't end up creating a highly volatile measure.