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Inflation Measurement and Inflation Targets: The UK Experience

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Like a number of other countries, the United Kingdom now conducts monetary policy by reference to an inflation target.[1] The target is for the 12-month percentage change of the RPIX—the Retail Prices Index, excluding mortgage interest payments. I should like to begin by saying something about RPIX specifically, before discussing some of the general problems of measuring consumer prices.

RPIX

The Retail Price Index is by far the most widely used measure of inflation in the United Kingdom.[2] Its components include an index of interest payments on home mortgages, which has a weight of 4.2 percent. Mortgages in the United Kingdom are predominantly at floating—rather than at fixed—interest rates. The index of mortgage interest payments is calculated using a long-term weighted average of a house price index (the term of the weighted average reflecting the average age of home mortgages) and the current level of mortgage interest rates. This procedure means that changes in monetary policy aimed at reducing inflation (by raising interest rates) actually cause the RPI to increase, and this makes the RPI itself unsuitable for inflation targeting purposes.[3] The Bank of England has devised another index, Housing-Adjusted Retail Prices (HARP). HARP incorporates an alternative measure of the cost of owner-occupied housing, based on the concept of the user cost of housing. The user cost is the cost of servicing a mortgage, plus the opportunity cost of the equity tied up in housing (net of capital gains on the house), plus depreciation and maintenance costs. The computation of HARP depends on assumptions about borrowing rates, alternative investment yields, and expected capital gains on housing. As a result, HARP probably suffers from greater measurement problems than RPIX. The use of RPIX means that housing costs are under-represented in the inflation target.[4]

How much does it matter? The question can be addressed by investigating the recent behaviour of RPIX and HARP. Figure 1 shows the recent behavior of 12-month percentage changes of the two indexes, and the table below shows means and standard deviations. The distributions of 12-month changes in both RPIX and HARP during the longer period are bimodal (see Figures 2 and 3). The figures show an abrupt shift downwards in each distribution between the earlier and later parts of the period. This is consistent with the view that a break in the inflationary process occurred during the recession of the early 1990s. Moreover it is clear from Figure 1 that during the 1980s HARP inflation very obviously led RPIX inflation by about two years, but there is no clear parallel lead relationship to be seen in the 1990s.

The early-1990s recession hit the housing market particularly hard. This seems likely to have led to the demand for housing as a store of wealth to be permanently lower. That in turn would be expected to lead to a one-off fall in the price of houses and thus the user cost of owner-occupied housing, relative to other prices. It seems likely that this episode changed the relationship between HARP and RPIX—or at least it seems unsafe to

[1] The Bank of England held a conference in March 1995 for central banks from inflation-targeting countries. See Haldane (1995).

[2] A very interesting account and history of the RPI is provided by Haworth (1995).

[3] For a lengthier exposition of the drawbacks of the mortgage interest component of the RPI, see Bank of England (1993).

[4] They are not completely unrepresented, because RPIX includes a housing rental element (although the rental market in the United Kingdom is not large) and has since January 1995 included an allowance for housing depreciation.

Figure 1

12-Month Percentage Changes in RPIX and HARP

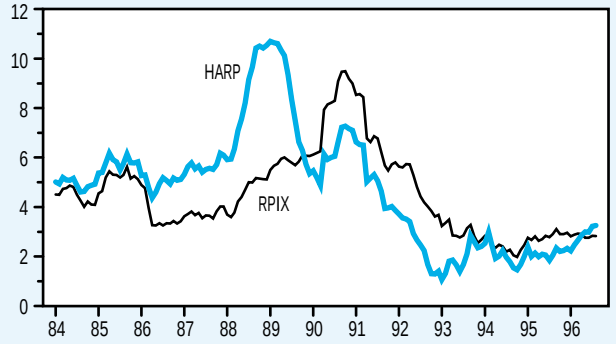


Table 1

RPIX and HARP 12-Month Percentage Changes

	Mean	Standard deviation	Highest	Lowest
	January 1984 - August 1996			
RPIX	4.51	1.73	9.49	1.98
HARP	4.75	2.39	10.69	1.07
	October 1992 - August 1996			
RPIX	2.81	0.39	3.84	1.98
HARP	2.13	0.53	3.19	1.07

Table 2

Results of Tests on RPIX and HARP

Null Hypothesis	*Test Period* October 1992-August 1996
Means of 12-month increases in RPIX and HARP are equal.	Rejected
Standard deviations of 12-month increases in RPIX and HARP are equal.	Not rejected

NOTE: The results were the same at both 95 percent and 99 percent confidence levels.

assume that the relationship did not change. Analysis of the current significance of targeting RPIX rather than HARP therefore has to be based on data from the second part of the period, since October 1992. Table 2 reports the results of tests of the hypotheses that the means and standard deviations of 12-month changes in RPIX and HARP during the period since October 1992 are equal. The validity of the tests depends on the series in question being normally distributed, and the hypothesis that they are normally distributed cannot be rejected.

As yet, a full business cycle has not been completed since October 1992. It is therefore too soon to tell whether the significant difference between the mean values of RPIX and HARP inflation since 1992 reflects a within-cycle fluctuation in the user cost of owner-occupied housing relative to other prices, or whether it is likely to persist from one cycle to the next.

To sum up, substantial evidence points to a shift in inflationary behavior in the early 1990s and good reason to believe that the relationship between RPIX and HARP changed then. Not enough post-shift evidence is available to support any firm conclusions about the consequences of targeting one index rather than the other.

RPIX includes indirect taxes. Since February 1996, the Office for National Statistics has published the Retail Price Index excluding indirect taxes (RPIY). Economists argue that the index used for the inflation target should exclude indirect taxes because a phased increase in indirect taxes that causes RPIX inflation to increase for a lengthy period should not provoke a *tightening* of monetary policy. It can however be argued that a phased increase in indirect taxes could be expected to cause RPIY inflation to decrease for a lengthy period and that such a result should equally not provoke an *easing* of monetary policy. Perhaps the decisive argument is that indexes which exclude indirect taxes are likely to be less credible as inflation targets to the public at large.

In addition to the issues specific to RPIX, a number of difficult and general problems arise when measuring consumer prices.

Figure 2

Distribution of 12-Month Percentage Changes in RPIX

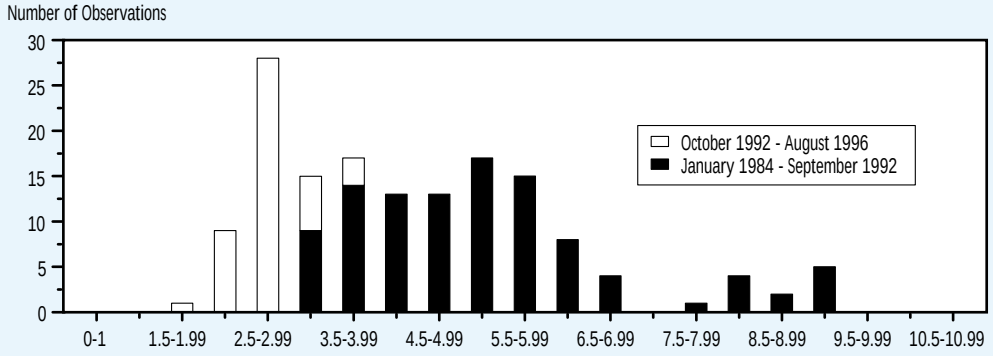
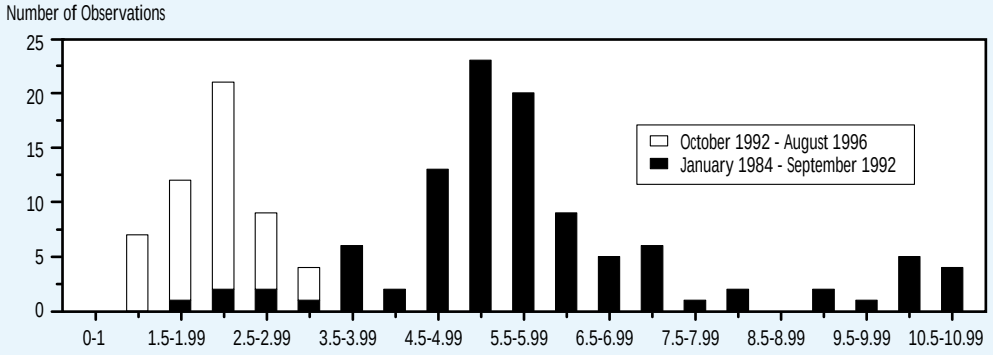


Figure 3

Distribution of 12-Month Percentage Changes in HARP



Current Consumption or Current plus Future Consumption: The Treatment of Asset Prices

As a matter of principle, should the chosen index represent the prices of goods and services for immediate consumption only, or should it represent the prices of goods and services for both present and future consumption? Alchian and Klein (1973) argue that the proper objective of monetary policy should be defined in terms of an index of present and future consumption, because an index confined to goods and services for current consumption fails to recognize the scope for intertemporal substitution in consumption. In other words, according to Alchian and Klein, the price indexes used for monetary policy purposes should include not only prices of goods and services for current consumption but also prices of present claims over future goods and services. Their argument is extensively and approvingly quoted by Goodhart (1995).

In practice, available consumer price indexes are neither indexes of prices of goods and services for current consumption alone, nor are they price indexes of both goods and services for current consumption and present claims over future consumption. Of course they include prices of goods and services for current consumption, but they also include prices of consumer durables, which provide services for some period in the future, until they wear out. But available price indexes do not include prices of present claims over

goods and services for future consumption other than services provided by consumer durables that can be purchased now.

With few exceptions, markets for future goods and services do not exist. Accordingly, no possibility exists of producing a price index of the kind Alchian and Klein recommend. But as they note (p. 176), "Since assets are sources of future services, asset prices provide clues to prices of present claims on future consumption." In other words, the practical implication of Alchian and Klein's argument is that monetary policy should take account of asset prices, as well as of conventional price indexes. Even so, asset prices need to be interpreted with care, as Alchian and Klein point out. For example, a change in the price of an asset may be caused simply by a reevaluation of the quantity or quality of goods and services it is expected to produce in the future. An asset price change thus caused does not imply any change in the price of present claims on future consumption. Moreover it is important to distinguish relative price changes among assets (and changes of the price of goods and services for current consumption relative to the price of present claims over future consumption) from changes in the general price level. All these problems of interpretation are, however, analogues of problems that arise in the interpretation of conventional price indexes: They are not specific to asset prices.

It would be possible to arrive at the same conclusion for monetary policy by way of a different route, not involving Alchian and Klein's argument. Suppose that monetary policy were concerned wholly with the prices of goods and services for immediate consumption. The rate of inflation of those prices is not affected immediately by monetary policy actions; a time lag exists. So monetary policy has to be concerned with managing the future rate of inflation and has to be based on a forecast of what the future rate of inflation will be. That forecast will be influenced by the current state of a wide range of economic variables, including asset prices. In other words, it is not difficult to justify the assertion that monetary policy should take account of asset prices.

THE IDEAL PRICE INDEX

If the ultimate objective of all economic activity is to produce consumer satisfaction, then the ideal consumer price index should measure the money cost of achieving a particular level of utility. Turning the economic concept into hard numbers is fraught with difficulties, however. The RPI in the United Kingdom disclaims the intention of measuring the cost of maintaining a particular level of consumer satisfaction. To quote the Department of Environment Retail Prices Index Advisory Committee (1986):

> *We wish to reaffirm the view taken by our predecessors that the RPI is an index of price changes and not a "cost of living" index. It is not designed to measure the effect of changes in the kinds, amounts and quality of the goods and services people buy, or in the total amount which needs to be spent in order to live. Nor does it measure changes in the cost of maintaining a particular level of consumer satisfaction. The RPI measures the overall change in prices by reference to the cost of a "basket" of goods and services which in turn is based on what households have actually spent their money on, the contents of the basket being brought up to date at the beginning of each year and then fixed for twelve months. We believe this to be the best practicable design for the index and see no reason to try to change it. However, we recognize that movements in retail prices must be an important factor in determining the cost of living however this is defined.*

It is commonly acknowledged that available price indexes overstate "true inflation" as defined by the ideal iso-utility index. There are several familiar sources of bias: outlet substitution, product substitution, quality changes and new products. Cunningham (1996) pro-

vides guesstimates of the biases in the RPI in the United Kingdom arising from these sources (see Table 3).

The most difficult conceptual issues arise from new products. In principle, the introduction of any new product widens consumer choice and makes it possible to achieve a given level of utility at a cost that may be lower than previously and will certainly be no higher. In other words the introduction of any new product has a neutral to negative effect on the true price index.[5]

How large are these effects? The introduction of a new brand of chocolate bar (if its price is the same as that of other brands) probably makes a negligible difference to the cost of achieving a given level of utility because it is likely to be a very close substitute for existing products. New products that are not close substitutes for existing products perhaps fall into two groups. New products in the first group provide the same service to the consumer as the old product, but at a lower cost. The introduction of such products self-evidently reduces the cost of achieving a given level of utility. Conceptually, it is straightforward to take account of this kind of technological improvement in price measurement; however, in practice it is extremely difficult. Nordhaus (1994) shows how technological improvements have reduced the cost of lighting services in the nineteenth and twentieth centuries. He also reaches the remarkable conclusion that traditionally constructed price indexes would exaggerate the rate of inflation of the price of lighting services over the period since 1800 by an average of 3.6 percent per annum.

New products in the second group provide services that were previously unavailable.[6] Treatment of such products in price indexes is very difficult in concept, let alone in practice. A good example is the introduction of pharmaceutical products that can improve the quality of life of people suffering from particular ailments. The introduction of such products can make an enormous difference to these people in the cost of achieving a given level of utility. The existence of such products also reassures nonsufferers that, if they contract the ailment, it can be treated. Such products are by no means close substitutes for existing products.

Table 3

Cunningham's Guesstimate of Bias in UK Retail Prices Index*

Outlet Substitution	0.10-0.25
Product Substitution	0.05-0.10
Quality Changes	0.20-0.30
New Products	0-0.15
Total	0.35-0.80

* Percentage per annum.
SOURCE: Cunningham (1996).

Real life price indexes make no allowance for new products in the second group. Nor could they. If indexes were to allow properly for such products, producers of statistics would need to know the elasticity of substitution in demand between new products and existing ones. Estimates of the elasticity could be obtained only after there had been time to analyze the demand for the new product in the light of experience. The resulting price index would by then be well out of date. There are, however, ample reasons for wanting to know the true rate of inflation (i.e., the rate of inflation of the ideal price index). One approach to estimating it could be to estimate an average amount of bias in conventionally measured inflation and adjust the conventional index to allow for it. However, this procedure would have to rest on the doubtful assumption that the degree of bias was constant over time (or that it varied according to some predictable pattern). The procedure would also have to rely on a numerical estimate of the bias that would be subject to a high degree of uncertainty.

IMPLICATIONS FOR MONETARY POLICY

How much do the thorny problems of measuring true inflation matter for mone-

[5] Equally, the withdrawal of any existing product has a neutral to positive effect on the true price index. As a matter of common observation, however, the process of economic growth has been accompanied by proliferation of available products.

[6] In practice new products do not divide neatly into two groups in the way I have suggested. But the two groups are a useful expositional device and—for the present purpose—are not misleading.

tary policy? The fact that these problems are so intractable has some bearing on the debate between inflation targeting and price-level targeting. Price-level targeting, as its name suggests, means fixing a target path for the price level for some period in the future. If in the early part of the period the price level moves above the target path—in other words, if inflation turns out higher than is implied by the target path for the price level—then later in the period the overshoot has to be corrected. That means that at some later stage inflation has to be lower than is implied by the target path for the price level. This is what distinguishes price-level targeting from inflation targeting: Inflation targeting does not require that a period of above-target inflation has to be compensated by a period of below-target inflation. In other words, inflation targeting permits base drift in the price level, whereas price-level targeting does not. Under inflation targeting, the price level follows a random walk. Under price-level targeting, the price level fluctuates around a predetermined path.

The attraction of price-level targeting is that it appears to reduce longer term uncertainty about the price level—something that might, for example, be important to those entering longer-term contracts denominated in nominal money amounts. Fischer (1994) summarizes the arguments for and against price-level targeting. No country currently uses price-level targeting, but some central bankers have seen price-level targeting as a possible later stage of development after inflation targeting.

A target path for the price level could be calibrated only by reference to a measured price index. However, the relationship between the path of any measured price index currently available and "true inflation" as defined by the ideal iso-utility index is not known. This implies that there is a limit to the reduction in longer-term uncertainty about the true price level that can be achieved by targeting any measured price index. In other words, the attractions of price-level targeting are not quite all that they might seem. This is relevant to the debate on price-level targeting; although, perhaps not decisive in resolving it.

More generally, it is impossible to resist the comment that monetary management in the United Kingdom in the nineteenth century and up to 1914 was widely regarded as successful in securing and maintaining price stability even though there were no consumer price indexes at all, let alone ideal ones. Likewise, monetary policy in most industrial countries in the 1945-70 period is widely regarded as having been generally successful, notwithstanding the universal absence of ideal price indexes. It is difficult, therefore, to regard these measurement problems as necessarily catastrophic for monetary policy. They do, however, suggest that it is likely to be difficult to identify at all precisely a growth rate of any available consumer price index that can be confidently claimed to be consistent with price stability.

How then should the objective of monetary policy be determined? As a generalization, monetary management in both the pre-1914 and 1945-70 periods achieved price stability according to the definition articulated by Federal Reserve Chairman Alan Greenspan (1989)—namely "price levels sufficiently stable so that expectations of change do not become major factors in economic decisions." It is going to be tough to arrive at a more precise objective than to secure price stability according to that definition.

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