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THE CONSUMER PRICE INDEX AND DIFFERENT HOUSEHOLD EXPENDITURE PATTERNS*

by

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The Consumer Price Index (CPI) is now used increasingly as the major reference point in adjusting pay and social benefits to "compensate" for inflation. This raises many interesting questions about the precise meaning of compensation, its feasibility and its effects as well as the suitability of the CPI for the purpose. This paper, which is part of work in progress on these issues, examines how price changes affect different types of household by virtue of differences in their expenditure patterns.

The present CPI is based on the estimated expenditure pattern in the average household, as revealed in the Household Budget Inquiry (HBI) 1965-66.¹ Since households differ in their expenditure patterns, different types of household are affected unequally when all prices do not rise at the same rate. For example, large families with low incomes devote a relatively high proportion of their total expenditure to food, so that they are more severely affected by an above-average rise in food prices. With acceleration in inflation, everyone has become more price conscious and there have been demands for the publication of separate CPIs for different classes of household.

What is often lost sight of, however, is that this phenomenon arises also when the general price level is constant or falling. Even when the overall price level is stable or declining, *relative* prices will still be changing. Of course, the matter receives less public attention than since general price compensation is not a live issue. However, the phenomenon we are concerned with is no different during rapid inflation unless relative prices of consumer goods tend to change more than in conditions of overall price stability. There seems to be a presumption in some circles not only that the relative prices of consumer goods do, in fact, alter a great deal more during inflation than in conditions of price stability, but also that they change in a manner unfavourable to the poor. However, there has been surprisingly little investigation of even the facts of the

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1. The 1965-66 HBI was confined to urban households, but the new HBI, carried out in 1972-73 and due to be published shortly, extends also to rural households.

situation, let alone disentangling cause and effect. If, as is likely, relative prices change more during inflation in the *short run*, it would be of particular interest to know whether these changes persist or are reversed in the next period.

There may also be some confusion about the mechanism by which the poor are affected by inflation. It is generally believed that the poor suffer most in inflation. One possible manner has been specified above and is the subject of investigation in this paper. But another major possibility is what happens to their money income relative to other groups: thus, in inflationary conditions, the poor may be unable to obtain compensation even for the average overall rise in prices. Their bargaining position is generally weaker; those among them depending on occupational pensions or income from past savings may get no increase in money income at all; there is often delay in the upward adjustment of thresholds for means-tested benefits; and the poor are more prone to lose their jobs should unemployment result from inflation. However, these effects concern relative money incomes and are an entirely separate matter from the question of relative price changes.

We have attempted to quantify the impact of relative price changes for different types of household over the period November 1968 to February 1975 and for the intervening years. In doing so, we felt it desirable to consider households differing in size as well as in income. To use a classification by income alone would involve lumping together, for example, households with the same household income but with widely different family size, and, therefore, widely different consumption patterns. The HBI provides a classification of households by both income and household size, giving a total of 16 household classes.

In order to use the HBI expenditure data in calculating a consumer price index for each household class, it is necessary to adjust the expenditure patterns in two respects. First, the HBI includes expenditure on certain items which are not used by the Central Statistics Office (CSO) in calculating the CPI, either because these items cannot be regularly priced (e.g. lotteries and betting payments) or because they do not fall within the definition of consumer goods (e.g. life assurance and pension contributions).² Second, it is necessary to update the 1965-66 weights to 1968 in order to correspond with the base used for the price data. The CSO have already done this for the overall consumption pattern to derive

2. The items are fully detailed in the *Irish Statistical Bulletin*, March 1969. Some of the exclusions have been the subject of controversy which we hope to consider in a later article. However, it is worth noting, since the matter is sometimes overlooked, that the exclusion of these items from the CPI is equivalent to including them with their appropriate weights and attributing to them the same price change as in the present CPI. In other words, their inclusion would alter the CPI only to the extent that their own price had risen more (or less) than the present CPI, and then only in proportion to their weight in total household expenditure.

the 1968 expenditure weights for the CPI, and we applied their adjustment ratios for all households to the HBI expenditure shares for each household class.³ The largest adjustment arises in the case of alcohol, because here the adjustment involves not only the change in dates but also the need to take account of the well-known propensity of households to substantially understate their alcohol consumption: our procedure involves an assumption that the propensity to understate is the same, relatively, in all types of household.

The CSO publish quarterly price indices for 10 *commodity groups* of consumer goods, which are aggregates based on the 371 detailed price *items* used in compiling the overall CPI. Even if we had data for all price items it would not be possible for us to apply them to the household classes. The reason is that the HBI gives a breakdown of expenditure only into 120 components for the household classes we are using and this would, therefore, be the greatest level of disaggregation possible. Even then, it would not necessarily be desirable to work at that level of detail for our classification of households because of limitations of sample size. The HBI is a sample survey, which has a sufficiently large number of households to provide a high degree of confidence in results involving *all* households. However, when the sample of households is divided up into 16 classes, as here, the number of households in a few of the classes is very small: at the extreme, for example, there are only 17 households in the category "7 or more persons under £10 a week". Thus, the accuracy of the recorded expenditure on many of the detailed items for such a class is rather doubtful.⁴ In technical terms, the standard error of the expenditure weight for the individual items is relatively large, and the resulting calculations using all detailed items could have an unacceptably high margin of error. Aggregation of the items into commodity groups involves a lower standard error for the group expenditure weights, and hence a higher degree of confidence attaches to the resulting weighted price index.

3. Following this procedure, the shares do not generally add up exactly to 100 per cent in each of the different classes. In such cases, we adjusted the share of each expenditure component proportionately by the amount of the overall relative discrepancy. However, in no case did the discrepancy exceed 5 per cent and it was generally much smaller. The fact that we have used the CSO adjustment procedure does not imply that we are entirely happy with it, but we have retained it in this paper for consistency with the overall CPI. Their method was to adjust the 1965-66 expenditures in the light of relative price changes between then and 1968, a procedure which implies that the relative quantities remain unchanged in response to relative price changes—in other words, zero price elasticity of demand. Also, no adjustment was made for the effect of real income changes on relative quantities arising from different income elasticities of demand. All experience goes to show, however, that, over such a short interval, a different adjustment procedure from that used by the CSO would make very little difference to the results.

4. Moreover, in cases where only a proportion of the households in any class purchase a given item the standard error may be greater still, though this is not necessarily so.

Nevertheless, of course, if the commodity groups used are too aggregative, the possibility of distinguishing differences in the overall price change for different household classes may be reduced. Of the 10 commodity groups for which the CSO publishes separate price indices, none, apart from food, accounted for more than 20 per cent of household expenditure in any of the household classes, and generally for a far lower proportion. Food, however, accounted for up to 50 per cent in some household classes and the proportion of expenditure devoted to different food items varied considerably. Hence, we sub-divided food into 12 categories on the basis of annual data for the percentage price changes in the 110 detailed food items covering the period November 1968 to February 1975, which were kindly supplied by the CSO.⁵ These, together with the 9 published non-food groups, gave us a total of 21 price groups which were then weighted by the corresponding expenditure shares for each of the different household classes. The results are given in Table 1.

Perhaps the most striking feature of the table is the very small differences between the classes over the period November 1968 to February 1975 as a whole. In that period, when the CPI rose by 103.3 per cent, the highest rise for any of the 16 household classes was 104.6, which occurred in the poorest class of all—the household with 7 or more persons and a household income of less than £10 a week in 1965-66. As mentioned already, there were few households in that class so that the standard error applying to the price figure would be relatively large. The lowest rise was 102.5 per cent, which occurred in the 1 or 2 person household in the second lowest income class. Thus, the bulk of the household classes differed by no more than one percentage point from the overall CPI at a time when it rose by over 100 per cent. Over this extended period, therefore, relative price changes had only a slightly different effect on different classes of household. In so far as there is any systematic tendency in the figures, it does emerge that the poorer households tended to have higher price increases, but the differences are extremely small—and undoubtedly insignificant statistically—for the period as a whole.

In individual years, however, larger differences emerged. For instance, in the year February 1970 to February 1971, when the CPI rose by 10 per cent, the price rise for the weakest class (7 or more persons with a household income of less than £10 a week) was only 8.0 per cent, while one of the better-off household classes (3 or 4 persons with a household income of £30 and over) had a price rise of 11 per cent. On the other hand, in the year February 1972 to February 1973, when the

5. These categories are as follows: confectionery; milk, cream and cheese; eggs; butter and fats; meat; fish; potatoes; other vegetables; fruit; beverages; sugar; and all other food. We derived the price indices for these categories by weighting the price indices of the component items by the corresponding expenditure shares of *all* households in the HBI.

TABLE 1: PERCENTAGE PRICE INCREASES FOR DIFFERENT INCOME GROUPS CLASSIFIED BY HOUSEHOLD SIZE 1968-75*

Period	Weekly Household Income in 1965-66																All Households (i.e. official CPI)
	Under £10				£10 and under £20				£20 and under £30				£30 and over				
	Household Size (persons)																
	7 or more	5 or 6	3 or 4	1 or 2	7 or more	5 or 6	3 or 4	1 or 2	7 or more	5 or 6	3 or 4	1 or 2	7 or more	5 or 6	3 or 4	1 or 2	
Nov. 1968-Feb. 1969	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Feb. 1969-Feb. 1970	3.2	3.2	3.2	3.1	3.3	3.3	3.3	3.2	3.3	3.4	3.4	3.5	3.4	3.5	3.6	3.4	3.3
Feb. 1970-Feb. 1971	5.9	6.0	6.1	6.1	5.9	5.9	5.9	6.0	5.9	5.9	5.9	5.9	5.7	5.8	5.7	6.1	5.9
Feb. 1971-Feb. 1972	8.0	8.6	8.9	9.2	9.1	9.5	9.6	9.9	9.4	9.9	10.2	10.9	10.1	10.6	11.0	10.5	10.0
Feb. 1972-Feb. 1973	10.1	9.9	9.9	10.1	9.9	9.7	9.5	9.5	9.5	9.4	9.4	9.4	9.2	9.2	9.1	9.2	9.3
Feb. 1973-Feb. 1974	11.6	11.8	11.3	10.9	11.1	10.9	10.4	9.7	10.4	10.0	9.8	8.9	9.7	9.4	8.9	8.9	10.0
Feb. 1974-Feb. 1975	11.8	12.1	13.1	14.0	12.4	13.1	13.5	13.7	12.8	13.3	13.6	13.3	13.4	13.6	13.7	13.7	13.5
Feb. 1974-Feb. 1975	26.3	24.6	23.9	23.1	24.8	24.0	23.4	23.2	24.7	23.9	23.6	23.8	24.1	23.8	24.1	23.9	23.8
% Increase over Full Period Nov. 1968-Feb. 1975	104.6	104.1	104.2	104.4	104.5	104.2	103.1	102.5	103.5	103.2	103.4	103.3	102.9	103.4	103.7	103.1	103.3

*Data throughout refer to urban households.

Source: See text for explanation of derivation of the figures.

CPI also rose by 10 per cent, the former household class had a price rise of 11.6 per cent while the latter had a price rise of only 8.9 per cent. However, there is no indication over the period covered that any one class tended to suffer systematically the greater the annual rate of inflation.⁶

It is possible that we would have got somewhat different results had we disaggregated further than the 21 commodity groups used. But, as mentioned already, the results would become increasingly unreliable. Moreover, it should be recalled that disaggregation would give a different result only to the extent that the prices of the items within the groups had moved relative to each other *and* expenditure on these items as a proportion of the total expenditure on that group differed as between different household classes. Thus, for example, within the meat group, it makes no difference to our results when the price of pork rises relative to the price of beef if all household classes devote the same *proportion* of meat expenditure to these items. Neither are our results affected when the proportions are different, if the relative prices of pork and beef are unchanged. Furthermore, even when the weights differ and the relative prices change within any group, as indeed they do, the overall effect on our results would be likely to be small in practice for two reasons. First, each of our commodity groups accounts for a comparatively small proportion of total household consumption in each household class. And, second, many of the groups are reasonably homogeneous so that the items within any such group are reasonably close substitutes, the relative prices of which would be unlikely to deviate widely.

These results have a bearing on the question of the need for separate official CPIs for different categories of household, for which there has been some demand in recent years. The National Prices Commission (NPC), in publishing the results of a somewhat similar exercise, stated :—

“We have published a summary of the results of the study to draw attention to an important area in which more economic and social research is required and to the urgent need for separate price indices

6. The only systematic factor evident in the figures is that, when the two lower income classes deviate from the overall CPI (whether above or below), the deviation almost always tends to increase with household size. Thus, from February 1970 to February 1971, for example, when prices rose least of all for the two lowest income groups (relative to the overall CPI, that is), the price rise was less the larger the household size. On the other hand, from February 1972 to February 1973, when prices rose most of all for the lowest income classes, the price rise was greater the larger the household size. This implies that since 1968, at least, the annual price changes for old-age pensioners (who are predominantly concentrated in the 1 or 2 person households in the two lowest income groups) was more in line with the overall CPI than the price changes for the large households in the low income groups.

for different groups within the community, and especially for pensioners and others with relatively low incomes".⁷

TABLE 2: PERCENTAGE PRICE INCREASES FOR DIFFERENT INCOME GROUPS, VARIOUS PERIODS

Weekly Household Income 1965-66	(1)	(2)	(3)	(4)
	May 1971 to May 1973*	Nov. 1971 to Nov. 1973*	Nov. 1968 to Feb. 1975*	Nov. 1968 to Feb. 1975**
	%	%	%	%
Under £4	24.5	22.6	106.3	104.9
£4-£7	23.4	22.7	105.2	104.7
£7-£10	22.1	22.3	104.0	103.6
£10-£15	21.7	22.1	103.2	103.0
£15-£20	21.4	22.4	103.6	103.6
£20-£25	20.6	21.9	103.9	105.6
£25-£30	20.2	22.0	102.2	102.3
£30-£40	19.7	21.6	103.1	103.2
£40-£50	19.9	21.9	103.0	103.2
£50 and over	18.5	21.2	103.3	103.5
All Income Groups	20.6	21.9	103.3	103.3

*Figures here are based on the 10 commodity groups distinguished by the CSO in the CPI.

**Figures here are based on 21 price categories as in Table 1.

Source: See text for explanation of derivation of the figures.

Their conclusion was based primarily on an examination of the price indices calculated for different household classes divided by household income (but not by household size) over the two-year period May 1971 to May 1973. The calculations were based on the CSO's 10 commodity groups. Data for that period are given in Col. 1 of Table 2 using the same income classes, and based on the same 10 commodity groups. Our data differ from those in the NPC report since we updated the weights from the 1965-66 HBI to 1968 to correspond with the CSO base, but the differences are slight. Had we confined our analysis to this period, we would have arrived at the same conclusion, namely, that the differences between the different income groups are relatively large and vary systematically with income. Thus, in this period when the CPI rose by 20.6 per cent, the highest increase (24.5 per cent) was in the lowest income class (under £4 a week), while the lowest increase (18.5 per cent) was in the highest income class (£50 and over). However, if we change the period slightly to November 1971-November 1973, which substantially overlaps the earlier period, we find that the dispersion is greatly reduced, as may be seen from Col. 2 of Table 2. In this period, the overall price

7. National Prices Commission, *Monthly Report No. 22*, October 1973, p. 17 (Dublin: Stationery Office, 1973).

increase was similar, 21.9 per cent, but the range of variation is now reduced to 21.2-22.7 per cent. Furthermore, the variation is no longer systematic through the income classes, so that no law of relationship applies. The compression of the range is in line with the tendency, evident in Table 1, for deviations in one year to be reversed in the next. Indeed, as Col. 3 of Table 2 shows, over the whole period November 1968 to February 1975, the range is less than in the two-year period studied by the NPC.⁸

Our results suggest that the need for separate official price indices may not be so pressing as suggested by the NPC. However, it might be argued that, even though there is little difference between different household classes over a number of years, the differences that arise in particular years are sufficiently great to cause concern. If the overall CPI rises by 10 per cent, but the price rise for the low income households is 12 per cent, while it may be consoling for them to learn that their relative position is likely to improve in the following year, they may have considerable problems in the interval. In such circumstances, if incomes are indexed, there would be general support for giving them a larger incomes increase in that year. But what of the following year if the overall CPI again rises by 10 per cent, and the price for the low income households rises by 8 per cent, but that of the high income households by 12 per cent? Would it be appropriate in such circumstances for the better-off to get an incomes increase higher than the overall CPI while the poorer classes got a lower increase? Obviously, this situation would be highly charged with social tension, with undoubted pressure for all classes to be recompensed at the highest rate of price increase. While there are compelling reasons for improving the lot of the poor, it should surely be done on wider criteria.

There is, of course, also the problem that pay adjustments do not, and cannot, take into account the vastly different household circumstances of different workers. Moreover, concern with poverty embraces many classes in addition to lower-paid workers. Protection of the poor in general is largely a matter for public expenditure and taxation, which must have regard to many different forms of deprivation. If a CPI for one of the

8. The final column of Table 2 gives the data for the period November 1968 to February 1975 using disaggregated food prices and weights. Thus, Col. 4 is based on 21 categories of goods and services, whereas Col. 3 is based only on 10. It will be seen that the more disaggregated data do not make any great difference: in fact, they reduce rather than increase the range of variation. This shows that it would be unwise to assume that the measured disparities between different household classes necessarily increase the greater the degree of disaggregation in the price and quantity data, a point which is, of course, already well known to statisticians. It may then be asked which index is best? Undoubtedly, the more disaggregated the index the better *if other things are equal*. The *ceteris paribus* assumption brings up the issue of the reliability of the disaggregated data, which we have already touched on in the text.

poorer classes, such as pensioners, were published by the CSO, then there would be strong demands for CPIs for all the social welfare recipients. The CSO might eventually find itself forced to give its official endorsement to, and to publish, a variety of CPIs which could be a source of confusion to the general public.

This is not to say, however, that the position of different classes should not be studied. In fact, no matter how many CPIs were published by the CSO, it is likely that government departments, research workers and others might want to study price trends for still other classes. What is required is that the CSO should regularly publish the basic data which would enable any interested party to calculate a consumer price for any major class. At present, such an exercise is made unnecessarily difficult for two reasons. The first is that weights of the classes relate to 1965-66, but in order to calculate the index it is necessary to update them to 1968, the date on which the price data are based. CSO have done this updating for the aggregate of households. It would be desirable if in introducing the revised CPI based on the new HBI, the CSO were to publish the adjustment factors in order to facilitate anyone wishing to update the weights for any of the different household classes distinguished in the HBI report. Second, the CSO do not publish the price indices for the component items of the CPI: they only give price indices for 10 broad groups and for the principal articles of food. There seems no good reason why the detailed price changes should not be published annually for all items, since such data have been supplied sporadically in response to parliamentary questions.

There may also be a need for expenditure tabulations on further classes of households which are not separately distinguished at present. However, there are limitations on the degree to which this can be done through the HBI. One, already mentioned, relates to sample size. Another arises from the fact that the HBI is concerned with households, whereas the object of interest may be the individual. Thus, for example, pensioners cannot readily be defined as a household class: some do form a complete household but others are part of a larger household. If our primary concern is with pensioners, the HBI cannot substitute for the need for specific inquiries into their situation. Such inquiries could also investigate another interesting aspect of prices which cannot be tackled through the price inquiries undertaken for the CPI, namely, whether the poor are forced to pay higher prices for the same or similar goods, due to such factors as their low credit rating, smaller scale of purchasing, etc—in other words, do their straitened circumstances make it harder for them to get the same value for money as the better-off classes?

Summary and Conclusions

In this paper, we have examined whether different classes of household

are affected unequally when the prices of different consumer goods do not rise at the same rate. In principle, such an effect could arise because different households, depending on their income and family size, purchase widely different "baskets" of goods. We were particularly concerned to see whether the lower income classes, either in large or in small households, suffered adversely in this respect at a time when the overall rate of inflation was high.

Our results, which cover the period November 1968 to February 1975, do not reveal any sustained or systematic tendency for a particular class to suffer adversely in this way. Over short periods, there are some differences as between different types of household, but these differences are soon reversed. Our findings, therefore, give no support to the demands, frequently canvassed in the press and elsewhere, for the publication by the CSO of separate consumer price indices for different household classes. It seems to us that it is far more important to the poor that they quickly receive compensation for the rise in the general consumer price level, as indicated by the present CPI.