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ABSTRACT

This paper presents new evidence on cost-of-living indices and annual inflation rates for the elderly population as well as the general population. It employs a now fairly widely accepted adjustment for the inappropriate treatment of housing in the Consumer Price Index. We disaggregate by five-year age cohorts for the elderly, and analyze various features of the differences in the inflation faced by the elderly and the general population, as well as within the elderly group itself. We conclude that, conditional on a housing adjustment, the inflation experience of the elderly from 1961-1981 was quite similar to the general population, both cumulatively and year-by-year.

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ARE INFLATION RATES DIFFERENT FOR THE ELDERLY?

by

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1. Introduction

A series of interrelated issues raises concern over the measurement of inflation for the elderly population. General interest in their absolute and relative economic performance, especially in the last dozen years, thorny economic and political problems concerning alternative indexing provisions for Social Security and other retirement programs, and concern over "budgetary control" all render the issue of inflation facing the elderly relative to the general population an important economic and social issue.

In this paper we present new evidence on cost-of-living indices and annual inflation rates for the elderly population as well as the general population. Employing a now fairly widely accepted adjustment for the inappropriate treatment of housing in the Consumer Price Index, we disaggregate by five-year age cohorts for the elderly, and analyze various features of the differences in the inflation faced by the elderly and the general population, as well as within the elderly group itself. We conclude that, conditional on a housing adjustment, the inflation experience of the elderly from 1961-1981 was quite similar to the general population.

Toward this end we present a very cursory discussion of some related estimates in the next section; discuss our methodology and report expenditure shares by age in Section 3; report our results for the different age groups of cumulative cost-of-living indices and annual inflation rates and analyze various aspects of the results concerning the potential differences in

inflation rates by age and other characteristics in Section 4; briefly present a rough order of magnitude of the potential excess "indexing costs" in Social Security recently in Section 5; and offer a brief conclusion which suggests that more fundamental issues concerning what we hope to accomplish with indexing appear to dominate, at least historically, the measured differences in inflation rates for the elderly and the general population, and therefore, current evidence offers no historical statistical support for the notion that a separate index for the elderly with which to index their Social Security and/or retirement pension benefits would have been worthwhile.

2. A Brief Literature Review

Several previous studies have attempted to adjust cost-of-living indices for the peculiar treatment of housing in the Consumer Price Index (CPI), and other studies using the standard treatment of housing have sometimes calculated separate cost-of-living indexes for the elderly. For example, Bridges and Packard (1981), using seven expenditure commodities and the traditional treatment of housing, divide the population into those 65 and above and 64 and below and study the period 1967-79. They conclude that the cumulative cost-of-living for the elderly by 1979 was about 2.3 percentage points higher than that for the younger population. Of course, since the consumption of housing is very different, as we will see below, for the elderly than for the general population, the standard treatment of housing can cause serious problems. In any event, a longer time period, a more appropriate treatment of housing, and a disaggregation of the elderly population are highly desirable.

Borzilleri (1980) studied the period 1970-77, using fifteen commodity classes, but continuing the standard treatment of housing and the simple division of the population into those 65 and above and others. Duffy (1979), using the standard treatment of housing and seven commodity groups, concluded that inflation rates increase slightly with age. Michael (1979) studied the period 1967-74. He excluded housing, and disaggregated into different age cohorts. His purpose was somewhat different from ours and the others: it was not primarily focused on age but on variations in the rate of inflation across individual households.

Dougherty and Van Order (1982), focusing on the inappropriate treatment of housing in the CPI, present several different measures of an adjusted Consumer Price Index. They conclude that "15 to 25 percent of the price rise since 1968 as measured by the CPI could be spurious." We present similar results below. They, however, did not focus on the implications of this for separate price indexes for the elderly.

Despite the lack of convincing evidence that the inflation experience of the elderly was markedly different from the general population, calls for developing a separate price index for the elderly continue. Since life expectancy has been increasing, the age structure of the elderly has also been shifting toward higher ages. Therefore, it is important to discover how measured annual inflation rates and cumulative costs-of-living differed between the elderly and the general population, and among the elderly. The main issues are treatment of housing, disaggregation by commodity classes and disaggregation by age. Each of the existing papers treats one or two of these; this paper considers all three.

3. Methodology

Our primary data source is the Consumer Expenditure Survey (CES). This survey was conducted by the Census for the Bureau of Labor Statistics. 19,975 households were interviewed, each over a 15 month period, to determine their expenditures in detail. The level of disaggregation was extreme: for example, expenditures on house slippers as distinct from sandals were determined. We use the summary tape which gives expenditures in about 60 categories; from this we aggregated still further into 17 broad categories, which are listed in Table 1; for the period prior to 1968, some adjustments were necessary and are discussed in the Appendix.

A price index in the n'th period can be written as

$$\frac{\sum_i p_i^n q_i^o}{\sum_i p_i^o q_i^o} = \frac{\sum p_i^o q_i^o (p_i^n/p_i^o)}{\sum p_i^o q_i^o} = \sum e_i (p_i^n/p_i^o)$$

where p_i^o and p_i^n are the price of the i'th commodity in the base and the n'th period; q_i^o is quantity purchased in the base period and e_i is the expenditure share on the i'th commodity in the base period.

To develop a price index for a particular group in the population, the group's expenditure shares on each commodity in the base period,[1] and the price changes from period to period, are needed. We calculate

the expenditure shares from the CES. The price changes are taken from the BLS publications, CPI Detailed Report. What distinguishes the price index of one age group from that of another are the share weights. The elderly population was divided into five groups: 55 through 59 years old, 60 through 64, 65 through 69, 70 through 74, and 75 and older. Following the BLS in its calculation of the official CPI, we calculated the expenditure shares of each of the 17 classes of goods over each age group by summing the individual shares weighted by the individual total expenditures. Thus, we calculated an expenditure-weighted average of the individual expenditure shares. This is formally equivalent to taking total age-group expenditures on all commodities. We were able successfully to match the expenditure categories in the CES to the commodity categories in the BLS so that the price change data would correspond to the share weights.[2]

Because a house purchase has an investment component as well as a consumption component, its treatment in the official CPI has become very controversial. There are two separate issues: the calculation of expenditure shares in the base period, and the changes in the costs of owner occupied housing.

The official CPI calculates the share of expenditures on owner-occupied housing in a manner which has no basis in economic theory: for the fraction of the population purchasing a home in the base period, the total purchase price plus total undiscounted interest expected to be paid over half the life of the mortgage are included as current spending! For example, someone purchasing a $100,000 home on a thirty year mortgage expecting to pay $150,000 interest for the first half of the mortgage would have $250,000 added to property taxes, insurance and maintenance and repairs for current housing expenditures. Thus, the CPI records anyone buying a home in the base period

as having spent virtually all of his income on housing (an expenditure share of about 1). Because of this approach, the relative weight of homeownership in the CPI had reached 23% by 1977. Since the owner-occupied price index was 317 by 1980 (the rental index was 191), the official CPI is dramatically overweighting a commodity whose price increases have been much larger than average.[3]

The best measure of expenditures on a consumer durable in some time period is the user cost of capital. Net of taxes, this is the price of the asset multiplied by the real rate of interest plus depreciation. Unfortunately, there is no widely accepted series on the real rate of interest, and in the case of housing, depreciation is not directly measured. However, in a competitive setting the rental rate of a consumer durable will on average be the same as the user cost of capital.[4] Fortunately, the CES asks owners of houses what they estimate the monthly rental of their houses would be. Although there will surely be considerable error in the response of any particular individual, there is no reason to suppose that there will be any systematic bias in the answers, and that, therefore, the average will be a good estimate of what houses on average would rent for. Our basic measure, the rental equivalent, is the owner's estimate of what the house would rent for on the market. This provides our estimate of the expenditure shares on housing. A rental equivalent series is used to estimate housing price change.

Table 1 presents the expenditure shares for the seventeen commodity groups, by age. The basic pattern of expenditure shares by age is that the elderly have a consumption bundle weighted more toward "necessities". For example, on food away from home, alcohol, tobacco, domestic services, home furnishings and recreation, the elderly spend 15.6% against 30.3% for those less than 60; whereas for housing, food at home and medical care, they spend a much larger fraction of

Table 1

Percent of Expenditure Shares by Age

	Commodity	Rental Equivalent				
		Less than 60	60-64	65-69	70-74	75+
1	Food at home	14.9	16.3	16.9	17.8	20.1
2	Food away from home	5.3	4.9	4.3	3.7	3.3
3	Alcoholic beverages	1.1	.8	.8	.6	.5
4	Tobacco products	1.6	1.5	1.4	1.1	.8
5	Rented dwelling & Other lodging	8.1	5.8	7.0	8.2	10.4
6	Owned dwelling, home	14.2	17.9	20.3	20.5	20.0
7	Fuel, utilities & telephone	6.4	7.3	7.7	8.3	9.2
8	Domestic services	1.3	1.6	1.6	1.8	3.1
9	House furnishings	4.7	3.9	3.7	3.0	2.6
10	Drycleaning & laundry	1.0	.9	.9	.9	.9
11	Clothing	7.0	5.6	5.0	4.5	3.7
12	Total transp. less other, vacation	20.2	17.8	15.2	14.2	8.5
13	Other transportion, exp &	1.3	1.7	2.1	1.8	1.8
14	Medical care	4.9	6.9	7.3	8.3	9.8
15	Personal care	1.1	1.5	1.5	1.5	1.5
16	Recreation, reading, TV, education	6.0	4.7	3.8	3.4	2.9
17	Miscellaneous	1.0	.8	.6	.6	.9

their income than do the non-elderly. The table also shows, however, that the expenditure shares of the elderly vary considerably by age, which implies that considerable age disaggregation is desirable. In particular those over age 74 have substantially different consumption patterns from the rest of the elderly. For example, those over 75 spend a much larger fraction of their income on food-at-home, home ownership, utilities and medical care and a much smaller fraction of their expenditures on food-away-from-home, clothing and transportation. The substantial differences in expenditure shares suggest that in a period of substantial differences in rates of inflation among different commodities, the inflation rate for different age groups may differ. To an analysis of this question for the period 1961-1981, we now turn.

4. Analysis of Results

Table 2 presents our cumulative cost-of-living indices (with 1967=100) for the period 1961 to 1981 for six age groups: 21-54, 55-59, 60-64, 65-69, 70-74, and 75 and over. For comparison, we also present the official Consumer Price Index for this period.

The first thing to note is that compared to our index the official Consumer Price Index, cumulatively, by 1981, substantially overstated the cost-of-living; this overstatement was about 22 basis points or approximately 10 percent. The difference is almost exclusively due to the treatment of housing. As far as age variation is concerned, as of 1981, the difference between the cumulative cost-of-living for any of the elderly age groups and the non-elderly population was quite small, as were the differences among the elderly age groups. The largest difference was that between 60-64 and the non-elderly, a difference of

Table 2

Cumulative Cost-of-Living

Year	Age Group						Official CPI
	Young	55-59	60-64	65-69	70-74	75+	
1961	90.5	90.4	90.4	90.5	90.5	90.5	89.6
1962	91.3	91.2	91.2	91.3	91.3	91.1	90.6
1963	92.5	92.4	92.4	92.5	92.5	92.5	91.7
1964	94.0	94.0	94.0	94.0	94.0	94.0	92.9
1965	95.6	95.6	95.6	95.6	95.6	95.6	94.5
1966	97.7	97.7	97.7	97.7	97.7	97.8	97.2
1967	100.0	100.0	100.0	100.0	100.00	100.0	100.0
1968	103.5	103.5	103.4	103.4	103.	103.4	104.2
1969	107.8	107.9	107.8	107.8	107.7	107.8	109.8
1970	113.0	113.1	113.1	113.0	112.9	113.0	116.3
1971	118.1	118.2	118.2	118.2	118.1	118.2	121.3
1972	121.5	121.7	121.8	121.9	121.9	122.2	125.3
1973	128.8	129.2	129.3	129.5	129.6	130.3	133.1
1974	142.2	142.7	142.8	142.7	142.9	143.7	147.7
1975	154.1	154.8	154.9	154.7	154.9	155.8	161.2
1976	163.8	164.6	164.7	164.3	164.4	165.0	170.5
1977	174.7	175.7	175.8	175.5	175.7	176.4	181.5
1978	186.3	187.6	187.7	187.4	187.8	188.8	195.4
1979	205.0	206.5	206.5	205.8	206.3	206.8	217.4
1980	228.2	230.1	229.8	228.8	229.2	228.9	246.8
1981	250.1	252.4	252.1	251.1	251.4	250.8	272.4

2 points, less than 1% of the cumulative cost-of-living. Therefore, conditional on correcting for the overstatement of the cost-of-living in this period due to the peculiar treatment of housing in the Consumer Price Index, the cumulative cost-of-living by 1981 was virtually identical for all age groups <u>despite</u> their substantial differences in expenditure shares.

Even though cumulative differences by age were small, inflation rates may have differed substantially in certain years. Since the CPI is used in the Social Security benefit calculation, yearly differences by age are important even if over many years the differences are offset. In Table 3 we give year-by-year inflation rates by age. We note that the inflation measures for any year across age groups are similar. For example, in the high inflation year of 1974, the non-elderly inflation rate was measured at about 10.4%, within two-tenths of 1 percentage point of that for any of the elderly age groups. Again, in 1980, the non-elderly 11.3% inflation rate was quite similar to that for most of the elderly, but did overstate inflation for those over age 75 by about two-thirds of a percentage point. Table 3 also shows that the official CPI substantially overstated inflation rates for the entire population from 1974 to 1980. For example the official inflation rate in 1979 was one-third too high.

As a way to summarize the inflation difference by age, we present in Table 4 the average difference over 1961-1981 between the inflation rate of each age group and the inflation rate of the non-elderly population. We also give the estimated variance of each difference and the maximum difference over these years.

These results are quite remarkable. The average differences amount to 1/2 of 1 percentage point or less. The maximum deviation for <u>any</u> year for any age group is still well below 1 percentage point. For example, between 1961 and 1981, for 65-69 year olds, the maximum deviation of our measured inflation rate

Table 3

Annual Inflation Rate, Percent

Year	Age Group						Official CPI
	Young	55-59	60-64	65-69	70-74	75+	
1961	0.00	0.00	0.00	0.00	0.00	0.00	.7
1962	0.96	0.96	0.92	0.87	0.84	0.70	1.2
1963	1.24	1.30	1.32	1.35	1.40	1.50	1.6
1964	1.69	1.65	1.65	1.61	1.58	1.58	1.2
1965	1.67	1.73	1.71	1.70	1.72	1.74	1.9
1966	2.13	2.17	2.19	2.20	2.21	2.29	3.4
1967	2.40	2.40	2.40	2.35	2.32	2.27	3.0
1968	3.47	3.46	3.45	3.39	3.35	3.36	4.7
1969	4.21	4.25	4.26	4.25	4.23	4.29	6.1
1970	4.76	4.82	4.84	4.86	4.84	4.87	5.5
1971	4.53	4.56	4.57	4.58	4.59	4.57	3.4
1972	2.92	2.98	3.04	3.13	3.18	3.37	3.4
1973	5.96	6.12	6.16	6.23	6.35	6.66	8.8
1974	10.39	10.49	10.43	10.24	10.25	10.26	12.2
1975	8.41	8.46	8.48	8.39	8.39	8.42	7.0
1976	6.28	6.30	6.28	6.19	6.16	5.94	4.8
1977	6.66	6.75	6.78	6.80	6.86	6.89	6.8
1978	6.64	6.78	6.77	6.79	6.89	7.03	9.0
1979	10.02	10.09	9.99	9.84	9.83	9.54	13.3
1980	11.34	11.42	11.30	11.16	11.09	10.66	12.4
1981	9.58	9.69	9.69	9.73	9.71	9.59	8.9

from the inflation rate of the non-elderly population was about 1/4 of 1 percentage point. The maximum devation was still smaller for the younger cohorts of the elderly population, and somewhat higher for the more elderly age groups. However, the maximum deviation for any elderly age group in any year was still only 7/10 of 1 percentage point, which occurred for those 75 and over. Thus, despite substantial differences in expenditure shares between the elderly and non-elderly and within the elderly population as they age, the actual historical inflation experience was quite similar for the elderly and the general population and for the different cohorts of the elderly in this 20 year period.

Table 4

Age Differentials in Inflation: Summary Statistics

Age Group	Mean Difference	Variance of Difference	Maximum Deviation of Difference
55-59	0.056	0.003	0.163
60-64	0.048	0.005	0.203
65-69	0.020	0.017	0.271
70-74	0.026	0.030	0.392
75+	0.013	0.103	0.702

Let us briefly state the major results of our exploration into housing adjusted, age differences in costs-of-living in the 1961-1981 period:

1. The cumulative Consumer Price Index with its peculiar treatment of housing overstated inflation by about 10%. This led to an over adjustment in the indexing of various contracts in the last several years.

2. The expenditure shares of the elderly relative to the non-elderly, and the elderly as they age, vary enough so that differences in the relative inflation rates by commodity could create a substantial difference in their impact on the standard of living of different groups.

3. Despite these differences in expenditure shares, the historical experience reveals quite similar costs-of-living cumulatively over the 1961-1981 period for all age groups considered. The cumulative difference in the cost-of-living by 1981, once the housing adjustment is made, is less than one percent.

4. The annual inflation rates are quite similar for the elderly and non-elderly, and the for the elderly as they age. In no year did the annual inflation difference between any elderly age group and the non-elderly exceed one percentage point. The usual differences were on the order of several hundredths of one percentage point.

5. In view of this marked similarity, the historical evidence does not suggest the need for a calculation of a separate cost-of-living index, once we adjust for a conceptually better measure of housing costs for the elderly. Of course, the differences in expenditure shares do indicate that potential differences should be monitored to see if they become large at any time in the future which may provide an impetus for a separate index.

Our results show that there is little variation in average inflation by age. However, as noted in Michael (1979), different individuals may face different inflation rates because of their different expenditure shares. To gain some insight into this potential non-uniformity in inflation rates within each age group, we analyze for two recent years of very high inflation, 1980 and 1981, the expenditure shares of 70-74 year olds to see how their inflation rates differed. For the year 1980, the range in measured individual inflation rates was from 7.5% to 19.1%. The average inflation rate for this group, as reported in Table 3, was 11%. The standard deviation within this age group in measured inflation was 2.3%. The range in 1981 when the average was 9.7% was 7.2% to 14.6% with a standard deviation of 1.0%. This amount of variation within age groups is typical for these years over other age groups in the population. Thus, the range of individual inflation rates within an age group was substantial, but the average for each of the groups was approximately the same. It follows that a standard inflation adjustment at the average value, even adjusted for the overstatement due to housing, would have over-indexed some individuals and under-indexed others. Since there is little variation in inflation rates by age, age is not of much use in finding more accurate inflation adjustments at the individual levels. It is, therefore, not clear what can be done about the individual inflation variations.

5. Application to Indexing Costs

A large number of issues surround the appropriate treatment of various programs and contracts in an inflationary environment. What is the appropriate measure of inflation? Is the purpose of indexing to insure some absolute purchasing power or some relative position? Should any

group in the population be fully insured against real income declines even when those are suffered by society as a whole? Each of these questions is beyond the scope of this paper and may dominate our ultimate alternations in indexing our contracts and government programs. It is, however, worth placing in perspective the overadjustment of Social Security benefit payments due to the overstatement of inflation in the CPI. We can calculate the cost-of-living adjustments that would have been made had our cost-of-living index been used, and compare them with what was actually done.

Our estimate is $5.7 billion worth of cumulative overpayment from mid-1978 through mid-1981.[5] This is not a trivial amount, but it is not large compared with the amounts involved in other kinds of policy discussions. For example, real Social Security benefits were increased by 25% or so in the late 1960's and early 1970's and subsequently indexed. A fundamental question is whether the social contract apparently made at that time, following a quarter century of extremely rapid economic growth and modest inflation, should be continued or should it be adjusted in light of the fact that productivity growth has fallen sharply and that those financing Social Security benefits through their current taxes have had very little gain in their standard of living. These are much deeper issues than can be addressed in this paper. We can, however, point out that obsessive concern with the cost-of-living adjustment is not justified, and certainly should not keep policy discussions from more important issues.

6. Conclusion

We have presented estimates on expenditure shares of the elderly and non-elderly population. We found there to be substantial variation in these shares by age. Because there has been considerable movement in relative prices over the last twenty years, it is possible that inflation rates have varied by age. Once an appropriate adjustment is made for housing, this does not appear to be the case. In the period 1961-1981, both the cumulative cost-of-living and the annual inflation rates have not varied substantially by age. This suggests that attention would better be focused on the fundamentals of what we are attempting to do with such indexing rather than on differences across age groups.

APPENDIX

Prior to 1968, disaggregated price series were available for only 12 categories similar to the subsequent disaggregation to 17. We matched the categories carefully and spliced the series. To check for any discontinuities, we took our larger number of categories back to 1968, the twelve up through 1969 and analyzed the two estimates of inflation for 1969. The differences were trivial and this result combined with Bureau of Labor Statistics statements made us confident that no major problem occurs because of the greater disaggregation available beginning in 1969.

FOOTNOTES

* This research is part of the NBER programs on Social Insurance and Pensions. We are deeply indebted to Dong-Ik Lee for valuabel advice and assistance.

1. Traditionally, the base period index is set equal to 100, so the formula above would be multiplied by 100.

2. We were not able to find a good correspondence for expenditures on miscellaneous current consumption expenditures (these include such items as banking fees, checkwriting charges, accounting fees, funeral expenses, etc.), so we eliminated these expenditures from the price calculations. In total, however, these expenditures are a small fraction of the expenditures of the elderly; among families with heads who are age 65 and over, the fraction on miscellaneous expenditures was less than 1%.

3. Congressional hearings have produced several "experimental" CPI measures, each assessing housing in a different manner. Our approach is similar to the rental equivalence measure which will be officially published in 1983 and used for indexing purposes in 1985, and we have calculations based on alternative user cost of capital estimates as well. These follow the same qualitative pattern as our rental equivalent estimates.

4. This general result is derived in Dougherty and Van Order (1982).

5. The official adjustment for 1981 was 10.2% based on annual averages first quarter to first quarter. By the end of 1981, the official CPI was rising less rapidly than the rental equivalent due to the sharp turnaround in the housing market.

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