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Timothy M. Smeeding

UNIVERSITY OF WISCONSIN - MADISON



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ABSTRACT

Intercity nationwide cost of living differences are estimated at low (poverty and below) income levels using the Bureau of Labor Statistics Urban Family Budgets for three higher living standards. In addition, intra-area big city-small city cost of living differences are extrapolated in the same way. The results support the conclusion that even the most extreme nationwide cost anomalies are not so large as to substantiate regionally differentiated income maintenance benefits or poverty thresholds. Such a policy would probably create much more inequity than it corrected. The intra-area differentials are smaller than inter-regional cost discrepancies in every case. Finally, a caveat is posed for the current welfare maze. Substantial money benefit differences in public assistance programs between the states are for the most part real benefit differences which may have caused unwanted migration of low-income households to high benefit states.

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INTRODUCTION

When considering the equitable distribution (and the efficient allocation) of social welfare benefits, the question of horizontal equity among the many diverse areas of the country is of considerable importance. To achieve this objective of horizontal equity, families of equal size, composition, and income should be paid equal real benefits. Although often overlooked, this issue is equally critical for a large number of other circumstances in which inter-area (or metropolitan-nonmetropolitan intra-area) comparisons of real economic welfare are necessary. Poverty determination and minimum wage legislation may be two such instances. Within the realm of federal income transfer programs, cash income maintenance, housing subsidies, and food stamps all face the test of horizontal equity. Substantial nationwide cost of living differentials at low-income levels would appear to call for regionally adjusted program benefits, minimum wages, or poverty yardsticks. If no such differentials exist at the income levels in question, then regionalization of subsidies is inequitable and inefficient, especially if it leads to unwanted interregional migration of families to higher benefit areas. Of course, this is a two-edged sword. If significant cost differentials do exist, and are not taken into account by the subsidy, then a uniform cross-country benefit schedule may produce inefficient migration based on real benefit differences. While state and local governments are free to choose any level of program benefits which suit the needs and/or preferences of their constituents, regionally differentiated federal benefits could be justified on grounds of real cost of

living differences if horizontal equity is one of the program's chief objectives. Some predeliction to "apparent" cost of living differentials has led many authors¹ to criticize the government poverty thresholds² for not taking this phenomenon into account. Similar arguments have been made concerning regionalization of income maintenance programs³ as well. Yet, possibly due to the lack of sufficient data, no one has estimated the size of these differences in order to substantiate their claims. It is intended that this paper will at least be a step in that direction.

DATA SOURCE

The data used in this paper was taken from the U.S. Department of Labor's Bureau of Labor Statistics (BLS) urban family budgets and comparative cost of living indexes derived from these budgets, for selected urban areas. These budgets were first drawn up in 1967 and since then have been revised for 1969 through 1972. Before presenting a simple theory of cost of living differences (insofar as BLS seems to see it) a brief digression on these budgets would be useful.

In 1967, BLS first published Three Standards of Living wherein they estimate the annual cost incurred by a typical four-person family⁴ for three different living standards (lower, intermediate, and higher) in thirty-eight different metropolitan areas and four regional nonmetropolitan places. These budgets are stated in terms of estimated gross money income (consumption plus taxes and other costs)⁵ needed to maintain the unit in question at some given equivalent level of living. By setting the total average budget across all areas at 100, a cost of living index is constructed for each of the three budget levels. Each of the 42 areas is then given an index number stating its percentage deviation from the norm. It is important to note that the BLS budgets are more than regional price indexes.

In addition to price differentials, these budgets reflect regional variations in climate (manifest in clothing and housing expenditures), transportation facilities, and diet, as well as state and local tax differences. Therefore, the estimated equivalent budget costs differ in type, quality, and quantity of goods as well as in price. It may be argued that these budgets are not strictly comparable since we are measuring different bundles of goods in each area as well as slightly different market baskets at each budget level. Similarly one may or may not agree with the specific judgments about needs which the BLS has made for each budget level. In addition to the differentiated market basket approach, BLS has done some unpublished cost estimates for the same bundle of goods in different areas. Irene Lurie (8:p. 246) cites one of these comparative cost index estimates at the low living standard for 1970. This index, calculated such that the only difference in costs between areas is due to price differences alone,⁶ showed only a 16 percentage point spread in total budget costs. In contrast, the published budgets for the 1970 lower level of living differed at most by 22 percentage points.⁷ Therefore, it seems as though pricing the same market basket in different places versus allowing budgets to vary both in prices and regional preferences, reduces the maximum nationwide cost differential by 6 percentage points (or 28 percent) at the lower (i.e., about \$7,000) living standard alone. However, relying on the BLS judgments on regional consumer tastes, all empirical calculations will be based on the published budgets where actual goods consumed differ by type and quantity as well as by price. The fact that this decision may impart some upward bias to estimated cost differentials is at least worth noting.

The internal composition of the BLS budget is approximately a fifty-fifty split between budget standards and consumption studies. Those

classifications of goods (food and housing) for which equivalent bundles have been developed, based on scientific health and nutrition standards, are determined in this way. Other budget components, for which no comparable standards exist, are derived from the BLS 1960-61 Survey of Consumer Expenditures and are therefore based on actual "average" consumer behavior.⁸ Since the original 1967 estimates, subsequent budgets have been adjusted for regional price changes in each of the major budget components⁹ as well as for the substantial changes in federal, state, and local taxes that took place from 1969 to 1972. The net results of this procedure do not average out to the yearly change in the Consumer Price Index due to a different weighting system. From 1970 to 1971, for example, the average change in the BLS budgets was about 5 percent while the change in the CPI for the same period was about 6.5 percent. The forementioned tax changes have also had a marked effect on these budgets. From 1971 to 1972, the lower budget only rose by 2.4 percent versus an approximate 4 percent change in each of the higher budgets. Econometric techniques will be used to correct for any remaining time trend in price changes which may upwardly bias the data. While the BLS cost of living budgets may be open to criticism until replacements or revisions are complete, they are the only available set of nationwide cost of living estimates.

A THEORY OF EQUIVALENT BUDGETS

As a first step in the analysis, the BLS budget methodology can be succinctly demonstrated in a nonrigorous theoretical model which yields some added insight on what to expect when income falls below their lowest budget standard. The BLS framework can best be illustrated in a simplified Lancasterian¹⁰ model of consumer technology. Essentially, the Lancaster model treats goods (and services) not as the ends of consumer preferences,

but merely as means to that end. The actual goods are treated as inputs, while the outputs certain "characteristics" associated with the consumption of these goods, become the arguments of our utility function. Following Lancaster (6), the consumer is assumed to have a preference ordering over the set of all possible characteristics and in traditional fashion, he attempts to maximize his welfare subject to the constraints of his economic situation. More formally, the simplified consumer choice problem can be stated in vector notation as:¹¹

$$\begin{aligned} & \text{maximize } U(C) \\ & \text{subject to } PX \leq Y \\ & \text{and } C = BX \quad X, C \geq 0 \end{aligned}$$

where U is assumed to be a well-behaved utility function and the budget constraint, $PX \leq Y$, is assumed linear. The BLS budget can be expressed in this model as follows: The maximand, $U(C)$, operates on some set of n characteristics which can be identified, in the BLS case, as predetermined acceptable levels of nutrition, health, comfort, shelter, amusement, etc., for each of their three budget levels. These designated characteristics are fulfilled by consumption of some available vector of m goods and services (X) subject to some vector of m regional prices (P) and own income (Y). In addition, the BLS utility function is constrained by a "consumption technology," $C = BX$. Since the utility function is defined on characteristics space (C), while the budget constraint is in terms of actual purchasable goods (X), $C = BX$ transforms physical goods into desired levels of characteristics. The elements of the consumption technology matrix, B , are assumed fixed and constant. Each coefficient in this matrix, b_{mn} , stands for the amount of good m needed to produce one unit of characteristic n . The BLS has determined these relationships either from scientific

and technical standards or from reported consumer behavior as previously mentioned. Different specific commodities (X) can be substituted for each other across regions, subject to the B matrix, such that the given level of each characteristic (C) is fulfilled. For example, hominy grits can be substituted for potatoes or corn so that the caloric-vitamin content remains constant, thus producing an equivalent amount of the characteristic "nutrition" which enters the utility function.

We can better exemplify the BLS problem for our purposes, by assuming that there is a one to one relationship between m goods (or better, m bundles of goods)¹² and n characteristics (m - n). Then we can translate the utility function into goods space (X) and write $U(C) = U(BX) = U(X)$ with B fixed and invariant. The explicit BLS problem we are concerned with, assuming that our budget constraint is fulfilled (i.e., $PX = Y$), is the "dual" programming problem of the original general model. That is, again in vector notation:

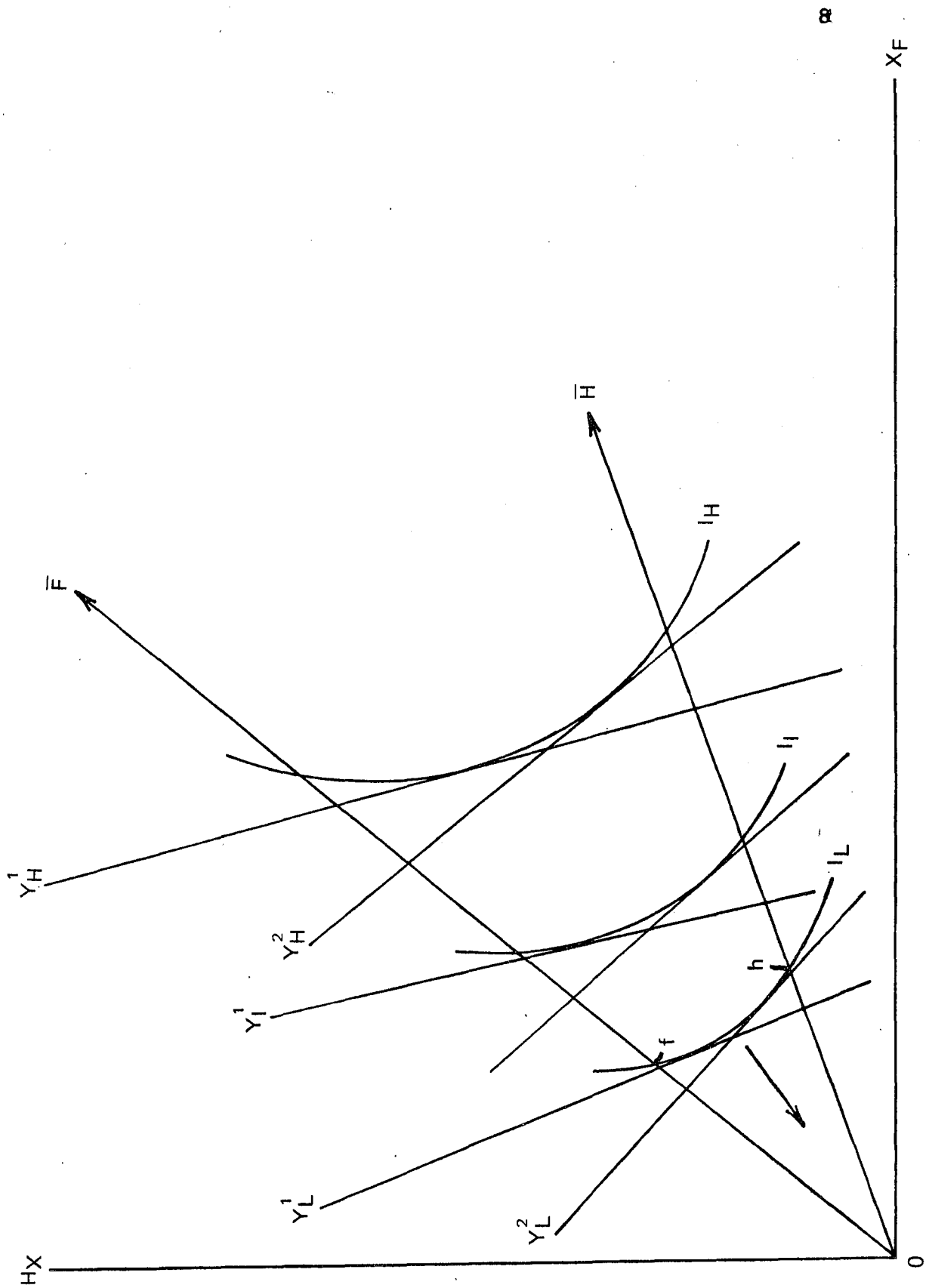
$$\begin{aligned} & \text{Minimize } PX \\ & \text{subject to } PX = Y \\ & \text{and } U(X) = U(C) = \bar{U} \\ & \text{where } C = BX, \quad X, C \geq 0 \end{aligned}$$

This identical process is carried out for all three BLS equivalent budget levels. That is, each living standard: lower, intermediate, and higher is determined by some fixed level of characteristics, \bar{U} , and in each of the 42 regional situations, costs are minimized to efficiently "produce" the given level of living.

For the purpose of graphically illustrating this model, we can restate the choice problem considering any two bundles of goods, say "food" and "housing," X_F and X_H , respectively. In Figure 1, let indifference curves

I_L , I_I , and I_H stand for the equivalent levels of well-being denoted by the BLS lower, intermediate, and higher budgets. The two linear rays, \bar{F} and \bar{H} , denote vectors of minimal bundles of food (\bar{F}) and housing (\bar{H}) that are specified such that the family can reach each budget level. These rays are only drawn linearly for clarity sake; their actual shape below I_L and between budget levels is, of course, unknown. Thus for the lower living standard, point h represents the minimal acceptable housing bundle that meets the designated level of the characteristic "shelter" as determined by our consumption technology matrix B for the lower living standard. Analogously, f delineates the minimum acceptable food package that will allow the family to reach the lower "nutrition" requirement. Of course, there are many different vector combinations of X_F and X_H , producing the same characteristic level \bar{U} , that lie between h and f on indifference curve I_L . In addition, there are actually 42 different sets of prices for these bundles, one for each region. Since both costs and types of goods producing the same equivalent characteristics vary across regions, there are 42 different levels of money income which minimize the cost function. For the sake of simplicity, we have drawn in budget lines for only two income levels, Y^1 and Y^2 , for each level of living. If we let Y_L^1 stand for the region or place where the highest money income is needed to reach our lower living standard and Y_L^2 the place where the lowest money income is required to achieve the same state of well-offness, then the difference between these two, $Y_L^1 - Y_L^2$, will be the most extreme cost of living gap at the lower living standard. It is hypothesized here that this dollar differential will continuously decline as we move from the higher to the lower standard and beyond, drawing near to zero before reaching the origin. Of course, this depends on a number of things; i.e., regional prices, low-income consumption patterns, and the shape of our rays \bar{H} and \bar{F} . Note that the

Figure 1
 Bureau of Labor Statistics Cost of Living Model



feasible region (the cone shaped area between \bar{H} and \bar{F}) declines rapidly as we move toward the origin. This is intuitively appealing since it suggests that as income falls, the range of choice of bundles that will fulfill our minimal characteristic levels also falls. That is, we become more and more limited in our possible patterns of expenditure as we move down the income scale. The goods we purchase become more homogeneous and basic. One might expect that the average prices of these "necessary" commodities are nearly the same on a cross country basis. Likewise, one would reason that as income falls, the most basic necessities, i.e., food and shelter, become a larger part of the total budget even though the range of choice within each of these categories becomes smaller. The 1960-61 BLS Survey of Consumer Expenditures shows that food and housing alone make up a full two-thirds of total consumption expenditures at low-income levels.¹³

Even if we accept the notion that equivalent bundles of goods become more identical as income falls, some regional price variations may still exist for the same bundle of goods and therefore perpetuate interregional cost differences. Although we don't have regional price indices for low-income consumption bundles in toto,¹⁴ we do have such an index for a fixed food basket alone. The BLS calculates nationwide cost estimates for a low-cost food plan for an urban family of four persons nationwide. Developed by the U.S. Department of Agriculture, these menus estimate the quantities of food in eleven groups needed each week for healthful meals.¹⁵ This food is then priced out at 20 cities, nationwide. The results for 1969 (the latest available year) show that the weekly costs for the Low Cost Food Plan for a family of four¹⁶ vary at most by only 1 percent nationwide. That is, when we take one fixed market basket and allow only for regional price variations, countrywide total costs are all within 1 percent.¹⁷ On average,

a can of soup, a loaf of bread, and a jar of peanut butter cost the same in Mississippi as they do in Chicago or Los Angeles. Hamburger may be slightly cheaper in Chicago, but fresh fruit and vegetables are probably more expensive. The exact opposite should be true in southern and western areas of the country. Increasingly more efficient means of transportation have narrowed interregional cost differences for basic commodities such that on a per item basis, they approach zero. Unfortunately, there are no such comparable figures for other bundles of goods consumed by low-income people. Faced with this perplexity, the best we can otherwise hope to accomplish is to extrapolate total cost differences at low-income levels from the available BLS cost of living data.

THE EMPIRICAL MODEL

Unfortunately, while the BLS budgets may provide a fair standard of comparison for income levels at or above the lower living standard (\$7,386 weighted average in 1972), they are too high for affecting the design of income maintenance programs, minimum wage legislation, or poverty status determination. The poverty line for a similar family of four in 1972 was only \$4,275, a little more than half the lower budget. Yet as the theoretical model predicts, a mere eyeballing of the BLS budget estimates seem to show that both absolute and relative cost differentials between areas decline as one moves from higher to intermediate to lower living standards. The main question we seek to answer here is then, what differences (if any) remain once income falls to poverty policy-relevant levels. That is, do cost of living differences approach zero at positive income levels? To answer this question, we have computed the most extreme inter-area budget level differences at each of the three levels of living (i.e., $Y_L^1 - Y_L^2$,

$Y_I^1 - Y_I^2$, and $Y_H^1 - Y_H^2$), and then applied regression analysis to extrapolate this gap back to lower income levels.

In addition, the largest intra-area metropolitan-nonmetropolitan budget difference was computed at each budget level and a similar projection was made. The latter model is tested in response to the claim that cost differences between metropolitan and nonmetropolitan areas within any one region may exceed the differentials found among many geographically diverse areas.¹⁸ Significant intra-area cost differences at low-income levels would probably be more important in stimulating inefficient migratory response to policy decisions than equivalent interregional differences. Psychic and physical moving expenses are lower, and more information on these cost differences would probably be available, within a smaller geographical area. One should be cautioned that the BLS intra-area budget differences do not strictly represent the cost of living difference between urban and rural areas. The BLS definition of a nonmetropolitan area is a place of from 3,000 to 50,000 inhabitants. Hence, the data only represent big city-small city differences, not farm versus metropolis.

ESTIMATION PROCEDURES

When attempting to choose the "correct" functional form in which to specify our empirical model there is no a priori preferable structure. Since we neither know the shape of \bar{H} or \bar{F} , nor are we sure how regional prices will vary for goods other than food at low-income levels, our theoretical model is at a loss in establishing the functional form in which to estimate cost differences. Should we expect that cost of living differentials decline in a linear fashion, or that a more conservative nonlinear rate or reduction where the slope tapers off as we approach the origin is appropriate? Surely both forms have the same origin--but which one

provides a better estimate of the actual rate of decline? Since we don't know where the next "standard" lies, we really can't tell what happens below the lower budget level without extrapolating from the given observations. By using both a linear and a nonlinear specification it seems as though we would have both an upper and a lower bound estimate to cost of living differences at low-income levels. Therefore the sets equations:

$$G_T = a_0 + a_1 (\bar{Y}) + a_2(T)$$

$$\ln G_T = a_0 + a_1 \ln (\bar{Y}) + a_2(T)$$

and $G_M = b_0 + b_1 (\bar{Y}) + b_2(T)$

$$\ln G_M = b_0 + b_1 \ln (\bar{Y}) + b_2(T)$$

were estimated for all five years and for the current 1972 observations alone.

G_T = The total nationwide cost of living gap between the highest and the lowest cost region at each budget level; i.e., $Y_L^1 - Y_L^2$, $Y_I^1 - Y_I^2$, and $Y_H^1 - Y_H^2$, for each of our years. The high estimate is usually a large metropolis (i.e., San Francisco, Boston, or New York) and the low estimate in almost every case is the nonmetropolitan regions of the South, with Austin, Texas or Orlando, Florida the exceptions.

G_M = The largest intra-area metropolitan-nonmetropolitan income gap at each budget level. At the lower living standard, the area with the largest cost difference is usually the Northeast. At the other two living standards the largest difference is found in the South, the Washington, D.C. area and the nonmetropolitan estimate being the exact location of this largest differential for each of our five years. By definition, $G_M \leq G_T$.

\bar{Y} = The weighted average total income necessary to maintain the given standard of living at each of our three levels.

T = A dummy variable employed to pick up the effects of any yearly time trend in the independent variables.

When using only one year's observations, the estimation problems seem substantial. Essentially, if we regress the 1972 budget levels alone, we are

trying to fit a line through only three points. With only one degree of freedom, projections must be made with a great degree of caution. However, by pooling the (three) yearly estimates of G_T and G_M for all five years, and by controlling for any time trend in the independent variables, we can predict the "gaps" based on fifteen observations instead of only three. The limits of extrapolation beyond the low living standard (our lowest observed income level is \$5,915) to critical income levels (\$4,275 and below) may be the most tenuous, yet certainly the most important part of the empirical analysis. We can at least calculate the standard error of the estimate at the predicted horizontal intercept (SEE at \hat{Y}_0) to see how far our confidence intervals have expanded and to therefore establish some margin of error for the predicted values of G_T and G_M .

EMPIRICAL RESULTS

Table 1 contains the results of estimating the maximum nationwide G_T (or $\ln G_T$) first using the 1972 data alone and then pooling all five years' observations with an added time trend variable. In Figure 2, we have plotted the pooled equations (3) and (4), for our estimates of G_T . The 1972 observations are indicated by an asterisk, the others by dots. The graph clearly illustrates how the addition of the other years' budgets considerably widens the range of observation for both the dependent and the independent variables. The solid portions of each line illustrate the range of incomes over which the given observations vary; the hatched portions are our predicted patterns of decline for the cost differentials. The shaded area of the graph identifies the critical area between our upper and lower bound estimates of G_T . Table 2 estimates the largest metropolitan-nonmetropolitan cost differential, G_M , in both linear and nonlinear form.

The empirical results are very encouraging. In seven of the eight cases, four for G_T and three for G_M , the estimated coefficients are at least significant at the 5 percent level. For equation (1) and all of the pooled equations, the results are significant beyond the .01 level for both the linear and nonlinear forms. More importantly, the constant term is significantly different from zero in all four estimated equations for G_T and in the pooled equations for G_M . Indeed, there is strong evidence that cost of living differences reach zero at positive income levels. The time trend variable, T , is significantly different from zero at the 5 percent level for both estimates of G_T , but not for those of G_M . The low SEE's calculated at the predicted horizontal intercept (i.e., $\hat{Y}_0 = \frac{a_0}{a_1}$) add credibility to the estimates of G_T and G_M . Yet, as we can more clearly see in Figure 2, there is a fairly large discrepancy between the estimated upper bound and lower bound of G_T . Comparing equations (3) and (4) we see that (3) predicts $G_T = 0$ where $Y = \$4,518$ while (4) predicts $G_T = \$764$ (16.5 percent) at the same income level. Similarly, comparing equations (7) and (8); $G_M = 0$ where $Y = \$4,348$ in (7), yet we find a predicted G_M of \$507 (11.6 percent) using equation (8). As we might well expect; since G_M is less than G_T by definition, the predicted upper bounds for G_T are greater than G_M at all income levels. It is noteworthy that the estimates gleaned from the 1972 data alone for both the linear and the nonlinear cases, are within one percent of those estimated by using the pooled equations.¹⁹ Since the added degrees of freedom in the pooled equations provide stronger estimates, only the values of G_T predicted in equations (3) and (4), and those of G_M in (7) and (8) will be referred to.

TABLE 1

Estimated Total Cost of Living Differences- G_T

Data & Form	Estimated Equations (+ values below)	R^2	SEE ⁵
1972 - 3 observations			
(1) linear	$G_T = -2490^* + .579^{**} (\bar{Y})$ (20.7) (59.7)	.9999	$\pm \$ 81.22^1$
(2) nonlinear	$\ln G_T = -7.607^* + 1.699^* \ln (\bar{Y})$ (8.1) (17.0)	.9983	.05 ²
pooled data - 15 observations ⁴			
(3) linear	$G_T = -2288^{**} + .560^{**} (\bar{Y}) + 153.28^* (T)$ (8.6) (21.5) (2.6)	.9888	$\pm \$160.26^3$
(4) nonlinear	$\ln G_T = -6.768^{**} + 1.593^{**} \ln(\bar{Y}) + .035^*$ (15.0) (32.3) (2.9)	.9949	.06 ²

NOTES: ¹SEE calculated at the horizontal intercept, $\hat{Y}_0 = \$4,302$.

²SEE here can be approximately interpreted as a percent deviation from the mean.

³SEE calculated at the horizontal intercept, $\hat{Y}_0 = \$4,518$

⁴These equations are plotted in Figure 2.

* Significant at .05 level.

** Significant at .01 level or better.

⁵SEE at $\hat{Y}_0 = E (Y - \hat{Y}_0) = S_{\hat{Y}_0} = \left[S^2 \left(1 + \frac{1}{n} + \frac{(\hat{X}_0 - \bar{X})^2}{\sum (\hat{X}_0 - \bar{X})^2} \right) \right]^{\frac{1}{2}}$ as shown in Kmenta (9), p. 213.

TABLE 2

Estimated Metropolitan-Nonmetropolitan Cost of Living Differences

Data & Form	Estimated Equation (+ values below)	R ²	SEE ⁴
1972 - 3 observations			
(5) linear	$G_M = -1787 + .389 (\bar{Y})$ (2.4) (6.5)	.9380	$\pm \$447.49^1$
(6) nonlinear	$\ln G_M = -7.515 + 1.64^* \ln (\bar{Y})$ (5.2) (10.8)	.9897	.08 ²
pooled data - 15 observations			
(7) linear	$G_M = -1482^{**} + .341^{**} (\bar{Y}) + 59.39 (T)$ (5.7) (15.2) (1.0)	.9763	$\pm \$160.93^3$
(8) nonlinear	$\ln G_M = -6.823^{**} + 1.55^{**} \ln (\bar{Y}) + .023(T)$ (11.2) (23.4) (1.4)	.9897	.08 ²

NOTES: ¹SEE is calculated at the horizontal intercept, $\hat{Y}_0 = \$4,590$.

²SEE is calculated about the mean and can be interpreted as a percent deviation from the mean estimated \bar{Y} .

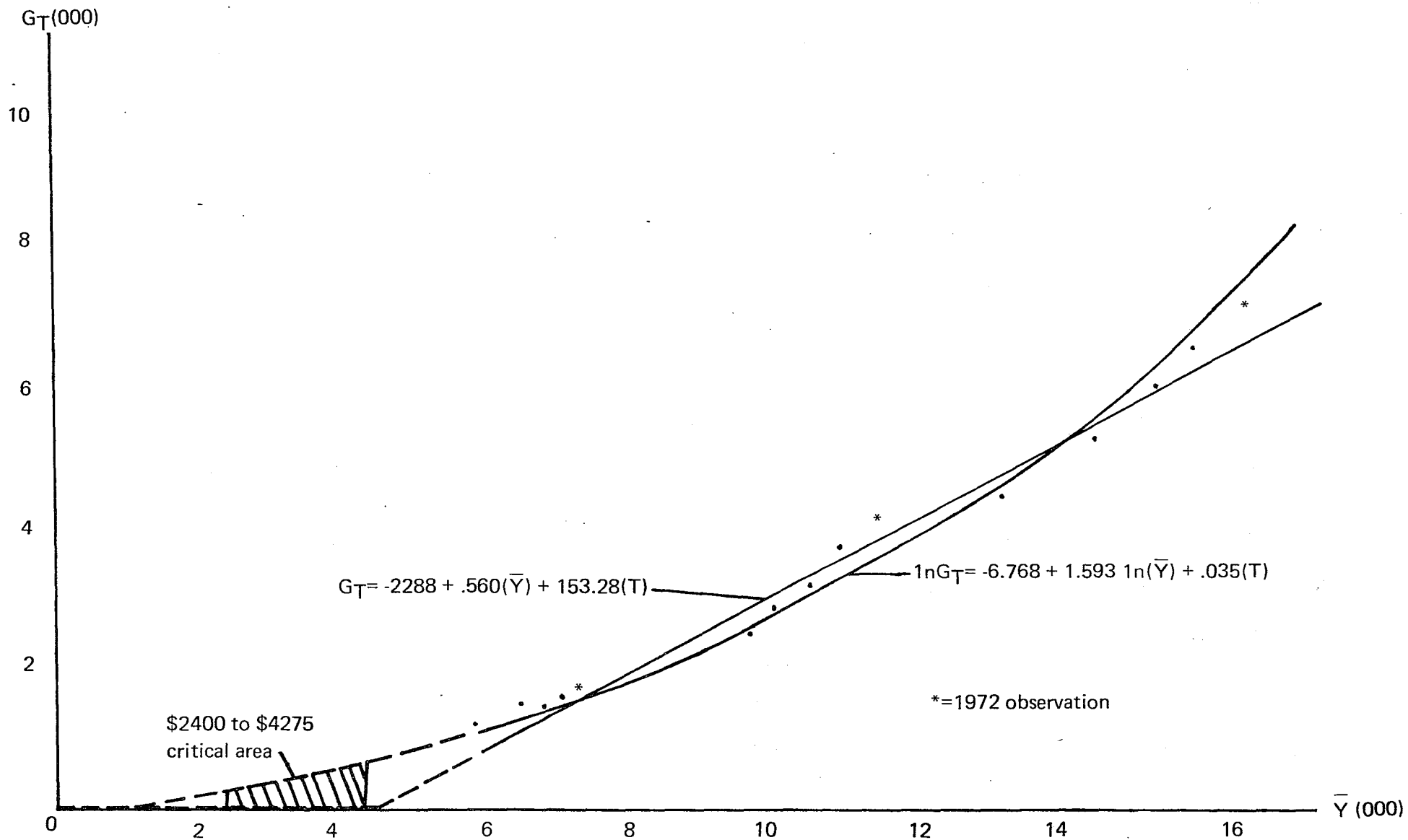
³SEE is calculated at the horizontal intercept $\hat{Y}_0 = \$4,345$.

⁴See is calculated exactly as in Table 1.

* Significant at .05 level.

** Significant at .01 level or better.

Figure 2
 Upper and Lower Bound Estimates
 of Cost of Living Differences at Low-Income Levels



ESTIMATED REGIONAL COST DIFFERENCES AT LOW INCOME LEVELS

Considering the predicted upper bound estimates of G_T and G_M alone in Table 3, estimated cost of living differentials are still fairly low at proposed policy relevant income levels. For instance, President Nixon's original Family Assistance Plan (FAP) proposal espoused an income guarantee of \$2,400 for a family of four. At this income level, the largest predicted nationwide cost of living difference is only \$279 or 11.6 percent yearly. Turning from fiction (FAP) to actual fact, the Social Security Administration's new Supplemental Security Income (SSI) program will guarantee at least \$2,340 to an elderly couple in 1974. Blowing this up for a younger four-person family, we would have a guarantee of \$3,959²⁰ for the first universal income floor that this country would have ever established. At this level, the expected value of the upper-bound estimates for G_T and G_M are only \$618 (15.6 percent) and \$430 (10.9 percent) respectively.

In July 1971, the highest nationwide Aid to Families with Dependent Children (AFDC) monthly payment (for a mother and three children) was \$313 in New York.²¹ Assuming another eleven months of the same, as rarely occurs, would result in \$3,756 for the year. This is very close to the total before tax yearly earnings of someone employed at the minimum wage of \$1.80, i.e., \$3,744 (\$1.80 per hr X 40 hrs X 52 wks = \$3,744) which is reported in Table 3. Here the largest possible yearly G_T and G_M are still only \$566 and \$401 each. Since almost all income support payments presently made are well under \$3,744 a year, \$566 doesn't seem like enough of a "bonus" to create serious inequity or to induce interregional migration. In all probability it wouldn't even cover moving expenses and costs of setting up a new home.

Finally, turning to poverty statistics, we see that $G_T = \$699$ (16.3 percent) and $G_M = \$494$ (11.5 percent) at the 1972 poverty line of \$4,275 for a family of four. Assuming for a moment that these highest estimates represent the true cost difference, we may be slightly overcounting the poor in the South or in smaller cities, while undercounting the same in the largest urban ghettos. If we have a true cost difference of about \$699 at the four-person family's poverty line, we may have about 300,000 less poor households (6 percent of 5.3m. total poor units) in the low cost areas of the South balanced off by the same number of additional poor families in high cost of living areas in the urban Northeast and the metropolitan West. From a big city-small city perspective, we estimate about a 3 to 4 percent shift in the poverty count from nonmetropolitan to metropolitan areas. It should be noted that these are very rough calculations.²²

But of course, we have only discussed the upper bound estimates of G_T and G_M . Up until this point we have said nothing of our lower bound estimates, i.e., a zero cost differential, in each of the relevant cases (FAP, SSI, AFDC, minimum wage earners, and poverty determination) as can be seen in Table 3. There seems to be little a priori reason for rejecting this lower bound estimate in favor of the nonlinear prediction. The linear specification of the model seems to fit the data just as well as the nonlinear form and in one case, equation (1) vs. equation (2), it even seems to statistically outperform the nonlinear model. To be sure, we are interested in absolute cost differences between places, yet reference to published 1971 and 1972 relative cost of living differentials (G_T/\bar{Y}) implies a linear or even an accelerating rate of decline as we move down the budget scale:

TABLE 3

Y	PREDICTED VALUE OF G_T					PREDICTED VALUE OF G_M				
	Upper Bound		(4)/Y	Lower Bound		Upper Bound		(8)/Y	Lower Bound	
	eq (2)	eq (4)		eq (1)	eq (3)	eq (6)	eq (8)		eq (5)	eq (7)
\$ 500	\$ 19	\$ 23	.046	\$ 0	\$ 0	\$ 13	\$ 17	.034	\$ 0	\$ 0
1000	62	69	.069	0	0	46	51	.051	0	0
2000	202	209	.105	0	0	143	151	.076	0	0
2400 ¹	275	279	.116	0	0	193	201	.084	0	0
3000	402	398	.133	0	0	279	284	.095	0	0
3744 ²	585	566	.151	0	0	401	401	.107	0	0
3959 ³	640	618	.156	0	0	433	430	.109	0	0
4000	654	629	.157	0	0	448	445	.111	0	0
4275 ⁴	733	699	.163	0	0	499	494	.115	0	0
5000	957	898	.179	403	243	646	630	.126	159	233

NOTES: ¹\$2400 is the income guarantee for a family of four under the proposed FAP.

²\$3744 is the amount one would earn for working 52 weeks a year, full-time for the minimum wage of \$1.80 per hour. Also \$3744 is very close to the largest current AFDC payment of \$313 per month (for 12 months) = \$3756 yearly.

³\$3959 would be the calculated income guarantee for a family of four under the SSI program. See footnote 20 for calculation.

⁴\$4275 is the 1972 poverty line for a nonfarm family of four.

		<u>Higher</u>	<u>Intermediate</u>		<u>Lower</u>	
		(A)	(A)-(B)	(B)	(B)-(C)	(C)
1972	\bar{Y}	\$16,558	\$5112	\$11,446	\$4060	\$7386
	G_T/\bar{Y}	.43	.07	.36	.11	.25
1971	\bar{Y}	\$15,905	\$4934	\$10,971	\$3757	\$7214
	G_T/\bar{Y}	.42	.09	.33	.10	.23

In 1972, the cost of living differential (G_T) relative to the given income level (\bar{Y}) changes by 7 percentage points between the higher and the intermediate budget levels and then by 11 points from the latter to the lower living standard. In addition, the dollar distance between these budgets is declining as well. That is, we observe a larger relative change (.11 vs. .07) over a smaller absolute dollar distance (\$4060 vs. \$5172) as income falls. A similar, yet not so pronounced trend is evident for the 1971 figures. If this pattern of decline were to continue, we should expect to have a relative difference of only about 7-10 percent at low-income levels. Even noting this pattern in the relative differentials alone, a linear rate of decline for the absolute gaps seem perfectly reasonable.

Some "best" estimate of the true unknown cost differences should be made. For lack of a better procedure, we will assume that the predicted inter- and intra-area cost differentials lie halfway between the extreme estimates. This yields an estimated differential of about \$350 or about 8 percent at the poverty line, the highest of our critical income levels. As we might well expect, this estimate is just about equal to the G_T predicted from the decline in the relative differentials noted above. For the other programs in question, we estimate a cost of living and difference of about \$283 or 7.5 percent for minimum wage earners and full-time AFDC recipients; \$309 or 7.8 percent for an expanded SSI program; and \$140 or only 5.8 percent for the FAP proposal. Quite analogously the "best" estimates of the intra-area cost differentials, G_M are even smaller for each

case. It is also worth remembering that these estimated differentials represent the most extreme cost of living gap between any two urban areas. The average nationwide differential is certainly less and probably more like half again the "best" estimates of the extreme gap.²³ Even taken at its worst, an 8 percent cost difference at the \$4,275 income level, or \$350 a year, does not seem so high as to substantiate a regionalized federal poverty index to say nothing of an income maintenance proposal with a poverty line income guarantee!

A note of caution is, however, given here. Essentially, the BLS reports the average costs for the given commodity bundle at each point of observation. Within any one city, however, there will be some variance around the average price of every good. For most types of goods, food for instance, we might expect that there should be little intraregional price variation for any given food basket. We have already mentioned that inter-regional food prices differ by only 1 percent for the low cost food plan and there doesn't seem to be any reason for assuming a different intra-area situation.²⁴

Housing expenditures, on the other hand, seem to show a wide price variance for the same "quantity" in any one area. Given the wide plethora of rules and regulations which affect the regional housing market: low cost public housing projects, rent control neighborhoods, subsidized homeowner loans, low-income property tax credits, veterans' mortgages, etc., there is probably more housing cost variation within any one area than between geographically distant regions. For instance, B. Bruce-Briggs (7), reports that the 1970 census found the median rent in Manhattan to be \$99. Given popular notions of New York rents (\$600+ "Park Avenue" apartments), there must also have been a very substantial number of \$50-75 units that we

really wouldn't expect to find there. It seems then, that any nationwide regionalization of housing benefits, or cash benefits in general, would probably cause more inequity than is mitigated, even if calculated regional cost differences supported such a policy.

IMPLICATIONS FOR THE CURRENT WELFARE SYSTEM: A CAVEAT

Based on these results, the current inequities in the cash value of state and local income transfers as well as the wide variations in the adoption of certain programs, produce real benefit discrepancies nearly equal to the observed dollar value of these differences. Interstate and interregional program inequities are by no means minor. In July 1971, while the largest monthly AFDC payment for a four-person family was \$313 in New York as previously mentioned, the highest actual payment for basic needs in Mississippi was only \$60, not to mention the additional program coverage for families with unemployed fathers (AFDC-UP) in New York, which is not available in Mississippi. For January 1971, the average benefit for an AFDC family of four was \$196.80 with regional variations from \$91.04 to \$268.40.²⁵ According to the estimates above, these otherwise "equal" families are facing nearly equivalent costs of living while benefits vary by a factor of up to five between states, and inter-area benefits on average differ by threefold. Quite obviously, substantial interregional inequities in real benefits (and hence real incomes) tend to exacerbate the migratory incentives believed fostered by the value of cash inequities alone.²⁶

CONCLUSION

It seems fair to conclude then, that regionalization of cash income maintenance programs, minimum wages, or poverty cutoffs is unwarranted based on the theoretical model and the empirical evidence presented here.

Regionalization of federal programs due to cost of living differences would create more inequities than it corrected either on a nationwide or on a metropolitan-nonmetropolitan basis. This result should also be extended to include in-kind transfers like food stamps or rent supplements which are close substitutes for cash payments. To be sure, we have found that the wide interstate variations in welfare benefits currently visible in public assistance programs are much more real benefit differences than the mere dollar apparition of these inequities which economists identify as "money illusion." Hopefully, the results of the 1972-73 BLS Survey of Consumer Expenditures, which are currently being tabulated, will provide added credence to the conclusions of this paper.

FOOTNOTES

¹See for instance, Lamale (5), Friedman (3), and Watts (17), (18). It is not clear whether Watts would favor regionalization in practice, yet his iso-prop poverty index does employ some a priori cost adjustments.

²Developed by Mollie Orshansky (10) of the Social Security Administration, it is used by the Census Bureau in estimating the "official" size and composition of the poverty population.

³See Lurie (8) for a thoughtful analysis.

⁴The "typical" family is composed of a fully employed 38-year-old husband, a wife not employed outside the home, a 13-year-old boy and an 8-year-old girl. In this analysis, only the continental U.S. was considered. Anchorage, Alaska and Honolulu, Hawaii were not considered due to the special circumstance and remoteness of each area.

⁵The cost of living estimates used in this paper are "incomplete" since the value of leisure, and the value of the environment are not included in the index. Likewise, the value of public services are not counted but federal, state, and local taxes are. To the extent that we have a system of benefit taxation, the given structure includes the value of public goods. One unexplored alternative might be to consider only the consumption components of each budget, leaving out taxes and work expenses. Then public goods are completely eliminated from the budgets and we are measuring only private living costs. We might expect that low-income people have relatively more leisure and make use of more "free" public services like parks and pools. Yet they are probably subject to a less advantageous neighborhood environment (i.e., higher crime rates, less sanitation, etc.). Therefore, the net effect of these unmeasured components is unknown.

⁶It should be pointed out that this is really only a close approximation to pricing the same basket in all places. In those regions where certain items of the original commodity bundle were unavailable, substitute items judged closest to the missing items were priced out by the BLS.

⁷See BLS (13), p. 13.

⁸Of course, expenditures for each item represent the average budget share for the given income level.

⁹Except for 1969 when each individual component for each budget was priced out. For a detailed breakdown of the components of the budget changes from 1971 to 1972, see BLS (15), p. 6.

¹⁰See Lancaster (6) and (7) for a more complete and rigorous theoretical framework.

¹¹Note that we have already implicitly assumed a one-to-one relationship between goods and activities in this construction. The generalized theory is much more complex. See Lancaster (6) p. 135 and 136 for a more detailed explanation. This model closely follows his discussion.

¹²Since the BLS does substitute different goods to achieve the same level of characteristics, $m > n$ is probably a more accurate description of the actual budget process. We only assume that $m = n$ for expository convenience.

¹³See BLS (16), p. 10.

¹⁴That is, there are no comparative cost estimates similar to those cited in Lurie (8) earlier, for the total market basket below the lower living standard.

¹⁵For a more detailed description see Brackett (1).

¹⁶The same size, age and composition family as that one used in the BLS cost of living budgets.

¹⁷Source: BLS Division of Living Condition Studies, Branch of Family Budgets, unpublished data, courtesy of Ms. Brackett.

¹⁸The four general areas of the country here are the Northeast, the North Central, the South, and the West.

¹⁹In Table 3, compare columns (2) and (4) or (6) and (8).

²⁰Assuming that the ratio of guarantees is equal to the rates of the aged couple's poverty line to that of the four-person family yields

$$\frac{2340}{X} = \frac{2530}{4275} \text{ and } X = \$3953.$$

²¹See Lurie (8), p. 226.

²²The estimates are based on the following reasoning. We are given the fact that 30 percent of all poor families were within \$700 of their respective poverty lines in 1971. [See U.S. Department of Commerce (11), p. 128]. If everyone had a poverty line of \$4137 (the 1971 four-person family threshold) and if the poor were all living at either the place of the high or the low cost estimate, then we might expect a substantial shift in the location, though not in the number of the poor. However, most poor families had poverty lines much lower than \$4137, and not all poor families lived in either the nonmetropolitan South or a large northern metropolis. Only 17 percent of the poor lived in the North, while 45 percent resided in the South. In addition, while 30 percent of all families were within \$700 of their poverty line, only 10 percent were within \$350 of their threshold. Taking all these

22 (cont.)

points into consideration, it is estimated that only about 300,000 or 6 percent of those families regarded as poor in 1971 would be affected. A similar indirect estimate was made for the metropolitan versus the non-metropolitan poor based on the fact that there were 10 percent more poor counted in metropolitan vs. nonmetropolitan areas [again see (11), p. 38] of the country.

²³The tabulated budget indices show the 42 measured budgets are roughly normally distributed about the mean at all three levels of living. If we assume this distribution continues to hold for lower income levels, then the average cost of living gap is about half the extreme predicted differential which is calculated from the two end points of each distribution.

²⁴There is some evidence, albeit inconclusive, that poor people in central city poverty areas actually pay more for goods than if they lived in suburban areas. If anything, it would be impossible, as well as inefficient, to attempt to correct for those anomalies by adjusting income transfers. In any case, this problem is more probably the exception than the rule.

²⁵These figures are taken from the JEC (9), pp. 145 and 151. It was pointed out by Mr. James Callison, Director of Supplemental Security Income Studies, Social Security Administration, that there may be some uncounted "special needs" payments that could diminish the variance in these figures.

²⁶That is, inter-area money benefit differences are made up of real differences and "money illusion" caused by higher cost of living in the higher benefit states. What we have shown here is that these inequities cause real income differences for the most part. The "money illusion" arguments should be minimized.

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