the equalizing effect of higher incomes, bisherto the harbinger of greater equality, diminished in these same largest urban places.

IV. Summary

While many studies have examined variations in income inequality between SMSAs, this study investigated a related subject that has received very little attention in the literature: the variations in inequality within metropolitan areas. Inequality was shown to be functionally related to size and the direction of change in urban population. First, inequality was found to be greatest for urban places with populations in the 2,500 to 10,000 size range, declines for urban places with populations 10,000 to 50,000, and rises for urban places with populations exceeding 50,000. Secondly, greater inequality is exhibited by growing urban places with populations to 50,000, while declining urban places exhibit greater inequality with populations exceeding 50,000.

Several variables were found to be associated with these relationships. Foremost, the residential location preferences of individuals in the professional and salaried managerial occupations for smaller and growing urban places were observed to have relatively greater positive effects on inequality in these same urban places. This phenomenon is important in explaining the greater inequality for growing urban places with populations to 50,000 and falling levels of inequality of urban size increases to 50,000. However, other factors, particularly race, household sizes with reported female heads, and unemployment, significantly contributed to the rise in inequality in the largest strata of urban places and explained most of the variance for these places declining in population.

We believe that we succeeded in revealing that significant variations in income inequality do exist within metropolitan areas.

Furthermore, the results of this paper lend support to the argument for disaggregated work in the area of the size distribution of income in large American cities.

References


An NIT for NYC: Analysis of a Policy Option

PAUL M. SOMMERS and PETER B. CULMAN*

New York City, which narrowly escaped default in 1975, is still in a financial position so precarious as not to preclude the possibility of bankruptcy in future years. Massive demographic and economic changes have forced the older urban areas such as New York to demand federal help to deliver the services they no longer have the resources to furnish themselves.

The City's options are limited. For example, the City is required by higher levels of government to provide certain services, notably welfare and medicaid. New York City's welfare-related expenditures in 1978 amounted to $3.5 billion. Of this amount, about $878 million more than twice the deficit for 1978 was raised by the City itself. No other major U.S. city pays as much of its welfare cost as New York does. New York State is only of twenty-one states that requires its local governments to contribute to the support of welfare programs. Of these twenty-one states, the local share is the highest in New York where it amounts to almost 25 percent of the total or roughly half of the nonfederal share.¹

In discussing Federal assistance, a distinction should be made between a simple reimbursement to the City for its own spending on welfare, on the one hand, and a complete structural reform in the system, on the other. While the City might be reimbursed for its fraction of total welfare costs, this strategy would do little to alleviate the alleged problems of administrative waste, revenue cover, excessive marginal tax rates, and adverse fertility and family break-up incentives that characterize what many people believe to be the "welfare mess." This paper therefore looks beyond a simple reimbursement to a fundamental change in the way income is redistributed, namely for New York City or the surrounding Standard Metropolitan Statistical Areas (SMSAs) to adopt a negative income tax (NIT). The NIT refers to a program which would provide a guaranteed income to all recipient units. In general, the higher the recipient unit's income, the lower its benefits. At some income level (called the breakeven level), there would be no payment, and at still higher incomes, the designated unit would pay an income tax.

The sections of this paper will unfold as follows. Section I proceeds with a discussion of the cost issue underlying a linear negative income tax. Of primary interest is derivation of the value of the marginal tax rate for positive-tax-paying families required to finance a linear NIT. In Section II, using data for New York City and New York's SMSA, we show the effects on taxpayers of (i) allocating a welfare budget by an NIT scheme and (ii) solving a deficit by an income tax.
increase (leaving all other taxes in place). Section III concludes.

I. The Cost Issue

Under an NIT plan, payments are made to the poor according to how much they earn per unit of time. If the recipient unit has no income, it receives the "minimum income guarantee" $(G)$ as a transfer payment. If the recipient unit does have some pre-tax income, the transfer payment is reduced by a proportion of that income earned. This proportion of reduction is called the "negative tax rate" $(r)$. At a certain level of income, payments are no longer made. When recipient units earn incomes above this "break-even level" $(B)$, they pay positive taxes.

In the absence of work incentive effects, suppose $G$ increases with $r$ fixed. Tax rates over the positive tax range must increase, for three reasons: (i) the NIT cost increases; (ii) the number of positive taxpayers decreases as $B$ $/G$ $r$ increases; and (iii) the taxable income $Y - B$ of each positive taxpayer decreases as $B$ increases. If there are work disincentives due to the $G$ increase, they create a fourth reason why tax rates must rise.

Suppose the full tax function is piecewise linear with positive marginal tax rate $t$. What value of $r$ is required to finance a linear NIT with parameters $(G, r, B)$ and with other government expenditure equal to $\beta$ times total income? Assuming no work incentive effects, the answer is the solution for $t$ of equation (1):

$$ t/r = \sum_i (Y_i - G) $$

where $t$ is the tax rate, $r$ is the negative tax rate, and $Y_i$ are the incomes of the recipient units.

II. The Data

In this section, the model formulated in the previous section is applied to New York City, an area which has historically attracted an inordinate number of poor and where taxpayers pay disproportionately large welfare costs. The income distribution data for New York City (as shown in Table 1) enable us to examine the effects of choosing between alternate minimum income guarantees and negative tax rates.

The cost of an NIT is defined as the sum of all payments over all negative tax-receiving recipient units: $\sum_i (G - Y_i)$. Once $G$ and $r$ are chosen, the average payment $G - \bar{Y}$ is the mean income for all recipient units earning below the break-even level of income is multiplied by the number of recipient units earning less than $B$ to obtain the NIT cost. A low cost calls for a small $G$ and a large $r$. A large anti-poverty effect calls for a large $G$ and a small $r$. Minimal work disincentive calls for a small $G$ and small $r$. Experimenting with different tax rates and guarantee shows how these trade-offs compel compromises in any income maintenance scheme.

Table 2 shows the NIT cost for New York City for various levels of generosity. A guaranteed amount of $3500 (a figure close to the New York City poverty threshold of $3530 established in 1970 for a family of four) with a tax rate between $G$ and $r$ would have resulted in a cost of between $1.5$ and $1.8$ billion, about the same amount (viz., $1.628$ billion) New York City spent on public welfare programs in 1970. These families and unrelated individuals with pre-tax incomes above the break-even level of income pay positive taxes while those with pre-tax incomes below this level receive negative taxes. The question is, what value of $t$ would be required to finance a linear NIT payments for families and unrelated individuals are $1544$ and $1304$, respectively. Thus, the cost of an NIT with parameters $(G = 2500$ and $r = 0.3$ would be $1544 + 0.3 \times 2500 = 1544 + 750 = 2294$. The mean income for all families in New York City earning less than $7000 is $3913$. The corresponding mean for all unrelated individuals is $2800$. Average

<table>
<thead>
<tr>
<th>Income Class</th>
<th>Families Number</th>
<th>Income Number</th>
<th>New York SMSA Number</th>
<th>Income Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $3000$</td>
<td>218,694</td>
<td>1,575</td>
<td>496,722</td>
<td>1,208</td>
</tr>
<tr>
<td>$3000 to $5999$</td>
<td>195,377</td>
<td>3,744</td>
<td>83,220</td>
<td>3,383</td>
</tr>
<tr>
<td>$5000 to $9999$</td>
<td>167,040</td>
<td>4,455</td>
<td>75,218</td>
<td>4,585</td>
</tr>
<tr>
<td>$10000 to $19999$</td>
<td>133,679</td>
<td>5,403</td>
<td>77,845</td>
<td>5,240</td>
</tr>
<tr>
<td>$20000 to $29999$</td>
<td>118,326</td>
<td>6,608</td>
<td>68,862</td>
<td>6,351</td>
</tr>
<tr>
<td>$30000 to $39999$</td>
<td>92,387</td>
<td>8,394</td>
<td>143,619</td>
<td>8,153</td>
</tr>
<tr>
<td>$40000 to $49999$</td>
<td>70,317</td>
<td>8,377</td>
<td>175,713</td>
<td>8,423</td>
</tr>
<tr>
<td>$50000 to $99999$</td>
<td>50,442</td>
<td>12,109</td>
<td>172,733</td>
<td>12,543</td>
</tr>
<tr>
<td>$100000 to $200000$</td>
<td>39,282</td>
<td>29,728</td>
<td>155,892</td>
<td>43,168</td>
</tr>
<tr>
<td>$200000 or more</td>
<td>25,452</td>
<td>42,728</td>
<td>136,584</td>
<td>59,170</td>
</tr>
</tbody>
</table>


[1] To discourage unrelated individuals earning below $B$ from deriving the (negative) tax advantages of "living in sin," the (G, r) combination for unrelated individuals was assumed to be that of the family for families. (Note that having both $G$ and $r$ halves the negative tax payments, but it does not alter the break-even level of income.) For example, if $G = 3500$ and $r = 0.3$, then $B = 7000$. The mean income for all families in New York City earning less than $7000 is $3913$. The corresponding mean for all unrelated individuals is $2800$. Average
TABLE 2 Nit Cost Estimates and Positive Marginal Tax Rates for Various \((G,r)\) Combinations: New York City and New York SMSA

<table>
<thead>
<tr>
<th>((G,r))</th>
<th>NY Cost (millions)</th>
<th>NYC (millions)</th>
<th>NYSMSA (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2000, 2757)</td>
<td>$1,028</td>
<td>$1,255</td>
<td>$2,370</td>
</tr>
<tr>
<td>(2000, 3251)</td>
<td>1,261</td>
<td>1,545</td>
<td>2,780</td>
</tr>
<tr>
<td>(2000, 5000)</td>
<td>1,312</td>
<td>1,578</td>
<td>2,676</td>
</tr>
<tr>
<td>(2000, 5033)</td>
<td>1,530</td>
<td>1,841</td>
<td>2,823</td>
</tr>
<tr>
<td>(2000, 4256)</td>
<td>1,541</td>
<td>1,832</td>
<td>2,604</td>
</tr>
<tr>
<td>(2000, 5000)</td>
<td>1,493</td>
<td>1,804</td>
<td>2,510</td>
</tr>
<tr>
<td>(2000, 6677)</td>
<td>1,749</td>
<td>2,104</td>
<td>3,022</td>
</tr>
<tr>
<td>(2000, 5000)</td>
<td>1,798</td>
<td>2,161</td>
<td>3,032</td>
</tr>
<tr>
<td>(2000, 5174)</td>
<td>2,055</td>
<td>2,470</td>
<td>4,200</td>
</tr>
<tr>
<td>(2000, 5000)</td>
<td>2,165</td>
<td>2,555</td>
<td>4,040</td>
</tr>
<tr>
<td>(2000, 4000)</td>
<td>2,338</td>
<td>2,706</td>
<td>4,531</td>
</tr>
<tr>
<td>(2000, 4000)</td>
<td>2,612</td>
<td>3,156</td>
<td>5,670</td>
</tr>
<tr>
<td>(2000, 4000)</td>
<td>2,984</td>
<td>3,607</td>
<td>6,613</td>
</tr>
</tbody>
</table>

with parameters \((G, r, b)\), given the level of other government expenditures and revenues.

New York City would have to raise enough money to meet the cost of an NIT and all the City's other expenses. In other words, \( t \) would be sufficiently low to be totally balanced to the taxing jurisdiction's budget. Simply:

\[
\text{Revenue} = \text{NIT Cost} + \text{Other Expenses}
\]

where "revenues" are defined as the positive marginal tax rate \((\tau)\) multiplied by all taxable income above the break-even level \((b)\), plus other sources of revenue apart from those obtained through local income taxation. New York City's expenditures, other than those related to welfare, totalled \$5.409 billion in 1970 and the City's revenues (excluding locally imposed taxes) were \$6.205 billion.²

Thus, equation (3) can be simplified as follows:

\[
\sum (G - rY) = \frac{-0.796}{B}
\]

\[
t_{NYC} = \sum (Y - B) - \frac{(NIT Cost) - 0.796}{(Total Income Above B)}
\]

Table 2 also shows \( \tau \)-values required for the \((G, r)\) combinations. Entering exceeding one would indicate that the \((G, r)\) combination could not be financed by New York City alone.

The calculations show that, in theory, it is within the fiscal capacity of New York City to adopt a relatively generous negative tax plan to replace its current welfare programs. Different magnitudes of \(G\) and \(r\) are practicable so long as \( r \) is less than one (you cannot tax anyone greater than their income). It would be possible, for example, to guarantee each family in the city a level of income commensurate with the defined poverty level. A guarantee of \$3500 and a negative tax rate of one-half would require a \( \tau \)-value of 4.1 percent.

In financing an NIT, an extra burden is placed on New York City's taxpayers to the extent that (1) there are spillover effects for which the City is not compensated and (2) public services have been far more generous in New York than in other large cities. Commuters and visitors who would benefit from the City's services would escape taxation because they live outside the taxing jurisdiction. The burden placed on those within the jurisdiction is thus disproportionate to the services they receive.

To internalize the spillover benefits and give some tax relief to the City's residents, the taxed region is conceptually expanded to include the SMSA which, in the case of New York, encompasses the City and its county areas: Nassau, Rockland, Suffolk, and Westchester. With the data on the SMSA, the degree to which the positive tax rate \((\tau)\) can be reduced is shown through the exercise of taxing the entire SMSA. The data in Table 1 show that 22.0 percent of all families residing in the New York SMSA earned less than \$6000 in 1970 compared with 26.8 percent of the City's families. In other words, New York City in 1970 had a relatively higher concentration of poor families existing within its boundaries than did the SMSA.

SMSA expenditures (excluding public welfare) and revenues (including locally imposed income taxes) as shown in Table 3 are used in equation (5) to find new values for \( \tau \).

\[
\sum (G - rY) = \frac{-0.932}{B}
\]

\[
t_{NYSMSA} = \sum (Y - B) - \frac{(NIT Cost) - 0.932}{(Total Income Above B)}
\]

Table 2 shows the New York SMSA \( \tau \)-values required for various \((G, r)\) combinations. As examination of the results reveals, by taxing the residents of the SMSA the welfare burden is distributed across a relatively larger positive tax base, resulting in lower \( \tau \)-values. For the chosen \((G, r)\) combinations, I now range from 0.08 to 0.01 whereas when City residents alone bear the full burden, the range is 0.10 to 1.10. The \$3500

A balanced budget requires that "revenues" or \(\text{revenue} - (G - rB) = \$6.205\) billion equal "NIT Cost + Other Expenditures" or \(\text{revenue} = (G - rB) + \$5.409\) billion.

Solving for \(\tau\) yields equation (4).

² These are lower bounds since they assume no work disincentives.

³ Due to limitations of the data, data ( Lowell means in Table 1 are assumed to be equal to those reported for residents of all metropolitan areas (except cities) rather than New York SMSA (New York City).

---

TABLE 3 Expenditures and Revenues for New York SMSA: 1970 (millions of $)

<table>
<thead>
<tr>
<th>Expenditures (excluding welfare)</th>
<th>Revenues (excluding local income taxes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York City</td>
<td>$5,409</td>
</tr>
<tr>
<td>Nassau County</td>
<td>$502</td>
</tr>
<tr>
<td>Rockland County</td>
<td>$136</td>
</tr>
<tr>
<td>Suffolk County</td>
<td>$567</td>
</tr>
<tr>
<td>Westchester County</td>
<td>$508</td>
</tr>
<tr>
<td>Total</td>
<td>$7,519</td>
</tr>
</tbody>
</table>

any) more than the current welfare system. Replacement of the current system with a somewhat less generous negative income tax presumably would be possible if the federal and state governments maintained their current outlays but the City stopped spending anything on welfare. The point is that New York City could have a rather nice slice of welfare cake with fiscal relief frosting on top.

III. Concluding Remarks

Although our calculations are based on 1970 census data and perhaps underestimate the magnitude of the current fiscal problem, the study is useful in showing the extent of potential relief to the City at a time when its current account deficit was over seven percent of its general revenues. It should be emphasized that we have considered in each calculation an NIT plan of total cost roughly equal to the programs it would have replaced. The cost of an NIT with a guarantee of $3500 (a generous figure by 1970 standards) and a payment reduction rate of .5 as well as the costs of providing all other public services in the New York SMSA could have been financed with a flat rate tax of 3.2 percent on incomes exceeding $7000. To a resident of New York City who is accustomed to paying rates ranging from 0.9 to 4.3 percent, the t-values presented in this paper (including the 3.2 percent figure above) seem tenable.

If, however, the tax rate required to finance an NIT plan in New York City were too high, there may be reasons—normative and theoretical, as well as political and pragmatic—why the plan’s scope could not be expanded to the rest of the metropolitan area. Moreover, given the alleged compliance and underreporting problems of an NIT, the SMSA may be a less suitable agency than the Federal government for dealing with those problems an NIT might introduce.

Given federal provision of AFDC and present New York state welfare laws, NIT for NYC is not now a feasible policy option. Yet, so long as municipal governments are saddled with a sizable welfare burden, there will be a need for exploring new policy options which might conceivably provide a basis for an NIT at the local level. The disincentive effects of an NIT, for example, compare favorably to the disincentive effects of a welfare program, since many welfare programs impose a 100% marginal tax rate on earned income. Moreover, disaffection with the “welfare mess” might lend us to look toward the relative simplicity of the NIT as a more efficient method of improving the situation of the poor.

References


A Note on Tax Shifting, Slope, and Elasticity

JONAS PRAGER*

All too often in our attempts to teach sophisticated concepts to students in the elementary economics course, we simplify to the point of error. One common such fallacy deals with the degree of tax shifting, and is a consequence of failing to distinguish properly between elasticity and slope.

Many elementary textbooks use the following example to demonstrate an application of supply and demand curve analysis. In Figure 1, the initial supply and demand curves, S and D, determine an equilibrium price at A. When a per-unit tax is imposed, S shifts upward to S1, resulting in a new equilibrium price, B. Since the tax equals the vertical difference between S1 and S, which is less than the difference between A and B, the tax has been shifted partially onto the demanders. The vertical difference between A and B measures the amount shifted onto the consumers, while the remainder, viz. the per-unit tax less (A - B) is borne by the suppliers.

Alternatively, consider the rectangular hyperbola demand curve portrayed in Figure 1 (a mathematical proof is offered in the appendix.)

*The author is Associate Professor of Economics, Department of Economics, New York University. Alain Ambacher and William J. Baumol offered helpful comments on an earlier draft.