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ABSTRACT

Milton Friedman has proposed that the negative income tax be a substitute for, rather than a complement to, current welfare and housing programs. This paper explores the possibility of substituting a negative income tax plan for public housing. A model is developed through which the impact of a change in income distribution on the housing market can be traced. Then data from the one in a thousand sample of the 1960 Census are used to estimate the number of substandard housing units that would have been rehabilitated to standard quality, if a 50 percent negative income tax plan would have been put into effect. One estimate that is derived, assuming that the income elasticity of housing is unity and the supply elasticity of rehabilitation is infinity, is that about 857,000 nonfarm housing units would have been rehabilitated to standard quality with the institution of a negative income tax plan. In comparison, during almost thirty years of the public housing program, 850,288 public housing units have been constructed.

IMPACT OF A NEGATIVE INCOME TAX ON THE NUMBER OF SUBSTANDARD HOUSING UNITS*

In recent years a number of economists and sociologists have proposed that a negative income tax be implemented to help alleviate poverty. Support for some form of income supplement has come from a wide spectrum of political positions.[1] Milton Friedman in particular has suggested a 50 percent negative income tax as a substitute for current welfare programs.[2] His argument is that the poor would be better off with a lump sum of money than with particular benefits, such as public housing, because they could choose to spend the funds in any way that they wished.

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[1] For a general survey of these proposals and the reasons for their support see, Clair Wilcox, *Toward Social Welfare* (Homewood, Illinois: Richard D. Irwin, Incorporated, 1969), pp. 248-269.

[2] Milton Friedman, *Capitalism and Freedom* (Chicago: The University of Chicago Press, 1962), especially pp. 190-195.

Although there have been many studies on the impact of a negative income tax on work incentives and the Federal treasury, no one has attempted to determine if such a policy would substitute for current housing policies, which attempt to improve housing to some standard level.[3] Regardless of the motivation behind a negative income tax proposal, if it should have an impact on the quality of housing, it would be useful to know what this impact would be in order to better plan other housing legislation.

An immediate difficulty in such a study is the definition of standard housing. On the one hand, a criterion based on market efficiency would be that standard housing is that quality that would cause the marginal social benefit (reduction of neighborhood cost of fire insurance, police protection, and welfare) to just equal the marginal cost of improving quality an additional degree, whatever that might be. On the other hand, a criterion might be that standard housing is that quality of housing that society believes to be minimal for decent living. Either criterion is nearly impossible to empirically implement. We will use the definition relying mostly on the latter criterion that is used by many housing analysts. It is in negative form, defining substandard instead of standard housing. Substandard housing will be defined as a unit that lacks some or all plumbing facilities, or is dilapidated. Dilapidation is the presence of defects making a structure unsafe. This definition does not take into account overcrowding.

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[3] For a recent bibliography see, Gail Schlachter, "Guaranteed Annual Income: A Selected Bibliography of Current Materials," unpublished paper, Institute for Research on Poverty, University of Wisconsin, 1967. Since beginning my own research, I have learned of another similar study on the impact of guaranteed annual income on housing markets: William G. Grigsby, "Possible Impacts of the Guaranteed Annual Income on Housing Markets," unpublished paper, March 1969. I have benefited from his study.

This study is an attempt to estimate the impact of one specific negative income tax plan on the number of substandard housing units, as defined above, in the United States. Specifically, we will use the 50 percent Friedman plan. That is, when a family's income falls below its tax deductions and exemptions, it will receive a benefit equal to 50 percent of the difference between allowable deductions and exemptions and income. For a single person deductions are $300 and exemptions are $600 for a total of $900. If a single person should earn no income he would receive $450 in benefits under the plan. The deductions and exemptions for a family of four are $3,000. If the family's income should be zero, it would receive benefits of $1,500. For every dollar earned, the benefit would be reduced fifty cents. A single person earning $400 per year would receive a benefit equal to fifty percent of the difference between $900 (the allowable deductions and exemptions) and $400. Such an individual would receive a benefit of $250. His supplemented income would become $650. If a family of four should earn $2,000, the difference between allowable deductions and exemptions and income would be $1,000, so that the benefit would be $500. They would receive an increase of income of $500/2,000 or 25 percent.

An operational model showing how a change in income distribution might affect the quality of housing is presented first. It is followed by empirical estimations from simulation of the impact of a 50 percent negative income tax on the housing market of 1960.

The Model: An Investment Approach

In this study we want to determine whether a given improvement in housing units will occur. In the real estate market, investors make this kind of decision often. They have to estimate whether to build a

particular kind of property in one place or another, or whether to improve a property, and if so, how much it should be improved. Their investment decision depends on whether the present value of incomes from the property will support the costs of construction. The problem is identical to the one undertaken in this study, so that we shall also use this approach.[4]

The present value of annual net income from real property can be expressed in the following way:[5]

$$V = \sum_{n=1}^{N} \frac{a}{(1+r)^n} = \left[\frac{(1+r)^n - 1}{r(1+r)^n}\right] a = Ba \qquad (1)$$

Where V = present value of income from property.

a = expected net annual income after deduction for maintenance, repair, taxes, and vacancy. (Alternately a may represent gross annual income, which is the rent expenditure of the tenant.)

N = the economic life of the structure, or in modern terms the period of time during which the investor wants to recapture his investment.

r = opportunity cost of capital. (Alternatively, if a is gross annual income, r would be gross rate of return and would include tax rate, rate for maintenance and repair, and vacancy rate, and opportunity cost of capital.)

n = years 1 through N.

$B = \left[\frac{(1+r)^n - 1}{r(1+r)^n}\right]$ = rent multiplier (alternatively if a is gross rent, B is the gross rent multiplier).

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[4] Ralph Turvey, *Economics or Real Property* (London: George Allen and Urnivin, 1957), pp. 8-24.

[5] Actually there should be no depreciation of land, so that the present value of land (V_1) would be calculated as follows:

$$V_1 = \frac{a}{r}$$

where a = annual net income to land
r = the opportunity cost of capital

Appraisers of a real property investment would calculate the land value separate from building value, compute the return necessary for land, and deduct this from the net annual income of the property. Equation (1) would then be used to calculate the present value of the building. Nevertheless, any separation of land and building value is arbitrary and fictitious. See Turvey, pp. 21-24.

At any time an investor will convert, merge, or improve real property, if the cost is equal to or less than the increase in value caused by the change. An improvement will occur if

$$C \leq V' - V$$

where V' = the present value after change.
V = the present value if there should be no change.
C = the cost of conversion, merger, or improvement.

The rule applies to conversion of land from agricultural to urban land use, as well as the conversion of single family houses to rooming houses, the demolition of old houses to construct an office building, or the improvement in quality of a residential building. In each circumstance the investor must estimate the expected annual income from the property before and after change, the expected life of the investment before and after change, and the opportunity cost of his capital.

With this information, an alternative way to represent the decision equation can be constructed in the following way:

$$C = B'c' - Ba \qquad (2)$$

where B' = the gross rent multiplier after change.
c' = the gross annual rent after change necessary to make $V' - V$ equal cost.
B = the gross rent multiplier before change.
a = the gross annual rent expected before change.

If the gross rent multiplier (B') after change would be equal to the multiplier (B), then equation (2) becomes

$$C = B(c' - a) \qquad (3)$$

and the expected change in value would be

$$V' - V = B(a' - a)$$

where a' = the expected gross annual rent after change. Thus, an improvement, conversion, or other change would be undertaken so long as

$$C = V' - V$$

$$B(c' - a) = B(a' - a)$$

$$c' - a = a' - a$$

or,
$$\frac{c' - a}{a} = \frac{a' - a}{a} \qquad (4)$$

This inequality shows that under the above assumption that $B' = B$, an investor will undertake a given change so long as the percentage increase in rent required to make the change in value equal to cost is equal to or less than the expected percentage increase in rents. The assumption that gross rent multipliers are equal before and after a change would be inappropriate for most types of changes in real property, but it may be a reasonable approximation for the change that we are going to investigate -- rehabilitation of substandard housing.

We now need to determine how the gross annual rent, a, of any property is established. The gross annual rents, hereafter called the rents, are established in local housing markets. The operation of these local housing markets can be shown to be similar to an assignment problem.[6] Consider a given community with a finite number of housing units of varying quality. There are as many families seeking housing as there are units. Each family is willing to bid a particular rent for each of the available housing units. The rent bid depends upon family preferences, incomes, the quality of housing, and the location of the units. In particular, location includes the distance of the dwelling from jobs and shopping, its access to recreational facilities and distance from nuisance effects (such as air pollution, and who is living in adjacent sites).

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[6] Martin Beckmann, *Location Theory* (New York: Random House, 1968) pp. 94-96; and Wallace F. Smith, "The Housing Stock as a Resource," *Papers and Proceedings of the First Far East Conference of the Regional Science Association*, 1965, pp. 77-92.

If the families were already in housing, these bids would represent bids on other houses and reservation bids on the one that they occupied. The latter, of course, must take account of the cost of moving to a new dwelling.

If there is competition in the property market, assignments of families to housing units will be such that rents will be maximized. Each family will occupy the house that it prefers the most and for which it can offer more rent than others. The rents established in this way are short-run equilibrium rents. There are two problems with this solution: first is that it is a short-run rather than long-run equilibrium; and second is that equilibrium rents do not exist if the above assumption that rents depend upon who occupies adjacent housing holds.

Let us take up the last problems first. Koopmans and Beckmann have shown that if each household rent bid is dependent upon who occupies the adjacent site, there is no set of rents that will cause an equilibrium.[7] There will always be at least one household that will find itself better off by moving to a new location. Such a result makes it awkward to apply comparative statics analysis because there is no settled equilibrium in the competitive housing market from which to analyze the impact of change.

Now we take up the first problem, which was that the assignment solution to the market is a short-run equilibrium. Perhaps some families after their assignments would be willing to pay increases in rents in order to improve the quality of the units that they occupy.

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[7] Tjalling Koopmans and Martin Beckmann, "Assignment Problems and the Location of Economic Activities," *Econometrica* (1957), pp. 53-76; and Martin Beckmann, *Location Theory* (New York: Random House, Inc., 1968), pp. 94-96.

Whether such quality improvements occur depends upon costs and the families' willingness to pay. Consider inequality (4). If the percentage increase in rent families would be willing to pay is greater than the percentage increase in rent necessary to pay off the cost, then the improvements would occur. If the improvements would be sufficient to make the housing unit competitive with previously better housing, the supply of such housing would increase, and the rents on that quality would have a tendency to fall. The rent that the improving family would be willing to pay for the better housing would not be as great as that of the occupants of the initial supply of that quality housing, or they would have occupied the better housing in the first assignment. Thus, the families' willingness to pay for the improvement would be less than the difference between rents on their current housing and on the better housing, so that their willingness to pay for improvements may be a good approximation for the market rent on the improved housing should it be accomplished. After all such improvements have been completed, the long-run equilibrium for a stable population would be acheived, so long as we assume each family's preference is independent of families living on adjacent sites.

Consider a change in the distribution of income among the families, such as would occur with a negative income tax. The above long-run equilibrium would be disturbed. Some families would find their incomes reduced by the increased taxes necessary to finance the negative income tax. Other families would find their incomes increased because their earnings were below their allowable deductions and exemptions. Since rent bids are a function of income, some rent bids will rise and others will fall. Furthermore, since there are many more families who will be taxed than there are families for whom benefits will be

allowed, the decreases in incomes and rents will be much smaller than the increases in incomes and rent.

Returning to the assignment problem again, and assuming that each family's rent bid is independent of those of families on adjacent sites, there is now a new array of rent bids for each of the existing housing units. At the upper end of the distribution there is no change in rank order of bids, although each bid may be somewhat less. At the lower end, however, there is a new income floor below which families do not fall. The income floor is different for different size families, being higher for families with more persons. Since the benefits vary by family size and income, some families may be able to shift above families that they were previously below in the rank order by income. Therefore, there may be some initial shifting of families into different quality units. In particular families with more persons may be able to shift up at the expense of smaller families. Since the average income of families receiving benefits has risen, all bids of these families will tend to rise. Nevertheless, with higher incomes, higher bids can also be made for improvements in quality. Thus, after the initial rise in bids there will be the secondary effect of families willing to pay more to have their assigned unit improved, but this increase would be insufficient to take units of better quality from higher income persons. The amount they are willing to pay depends upon their income elasticity of demand for housing. In some cases their bid will be sufficient to improve quality, and in other cases not. If they can afford a higher rent that will support an investment, their unit may become competitive with those occupied by higher income persons. In this case the increased supply will tend to force rents down, So once agin the rent bid the family is willing to make is probably a good proxy for the

increase in rent because it is less than the initial rents for higher quality, or they would have occupied the better housing in the first place.

To work out the empirical problem we need to make several assumptions with respect to the above model. They will cause our results to be only approximations, and to the extent that these assumptions are unacceptable to others, the results will be questioned. Since there is no possibility at this time of estimating the accuracy of the predictions, we must look to the reasonableness of the assumptions.

As is apparent from the above discussion, the first assumption that is necessary is that a family's demand for housing is independent of the decisions of other families. Obviously this assumption is not exactly true. Indeed, the interdependence of consumer preferences for housing has been considered as one of the factors preventing rehabilitation of neighborhoods, when such rehabilitation would otherwise be profitable.[8] If one house in a blighted neighborhood were to be improved, its rent would not rise much and might not rise sufficiently to pay the cost of the improvemnt. The rent is held down by the general quality of property in the neighborhood. In such a situation the private market may be unable to improve blighted neighborhoods, even if it should be profitable to do so. It is important to recognize, however, that such neighborhoods may not generate sufficiently high rents for improvement, even if the interdependency of consumer demand were not present. There were at least three reasons for accepting the reasonableness of the assumption that consumer demands are independent for our problem. First, a negative income tax plan would cause a general shift in demand

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[8] Otto A. Davis and Andrew B. Whinston, "The Economics of Urban Renewal," *Law and Contemporary Problems* (Winter 1961), pp. 100-110.

in the same neighborhood, so there might be pressure for a general improvement of a neighborhood. Second, there is an allowable amount of variation among rents in the same neighborhood even when preferences are interdependent. Third, so long as there are vacancies in the stock of housing, competition to hold families with negative income tax benefits would result in improved housing. Families with income supplements might be able to pay the higher rents for vacant standard housing. If substandard housing vacancies rose as a result, their owners would be forced to imporve them or lose all revenue.

The second assumption is that the income elasticity of demand for housing is unity. The percentage increase in rent that families will be willing to pay will be equal to the percentage increase in their income. Recent studies of the income elasticity of demand for housing in the United States and other countries show a range between .3 and 2 or 3.[9] Most estimates are in the range of .6 to 1.

The third assumption will be a neutral one that there will be no change in the costs of home repair and improvements because of any increase in construction activity caused by the negative income tax benefits. There have been no studies of the supply elasticity of the residential construction industry that I have been able to find. There are, however, several facts indicating that the industry is a constant cost industry. One study found that the expansion and contraction of the industry was swift during periods of change and showed little change in costs.

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[9] Margaret Reid, *Housing and Income* (Chicago: The University of Chicago Press, 1962); and Tong Hun Lee, "Housing and Permanent Income: Tests Based on a Three Year Reinterview Survey." *Review of Economics and Statistics* (November, 1968), pp. 480-490.

per dwelling unit.[10] Although a massive increase in home improvements could cause increases in such costs in order to bid resources away from alternative employments, the shift may cause the industry to reorganize and find more efficient ways of doing operations currently performed on a custom basis. Greater efficiency might result in home improvement costs decreasing in the long run. Since there seems to be no clear-cut evidence for either decreasing or increasing costs, the neutral assumption that no change in costs will occur will be made.

The investment model together with the last three assumptions allows estimation of the impact of the negative income tax on the number of substandard housing units improved to standard quality. For each substandard housing unit one needs to estimate the percentage increase in rent necessary to support the rehabilitation of that house to standard quality, $(c' - a)/a$; and the percentage increase in rent that families will be willing to pay out of increases in income from negative income tax benefits, $(a' - a)/a$. Applying inequality (4), count the housing units for which the percentage increase in rents that families are willing to pay is greater than the percentage increase in rents required to pay off improvements.

Such a Census would be exceedingly costly. An alternative is to randomly select a number of families, pay them the benefits that they would receive from a negative income tax plan, see how they spend their increase on rent, and how many of their housing units are improved to standard quality. An experimental study along these lines on many

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[10] Sherman J. Maisel, *Housebuilding in Transition* (Berkeley: University of California, (1953).

aspects of a negative income tax is being tried for a three year period.[11] The main difficulty for an analysis of housing is its short time horizon of three years. Many home improvements will require a longer time horizon to be paid off through increased rents.

In this study, probability distributions of the percentage increase in rent families would be willing to pay for improved housing with income supplements and of the percentage increase in rents required to improve substandard housing units to standard quality will be estimated from two separate data sources. On the basis that they are independent events, these two distributions will be combined into a joint probability distribution from which one can estimate the proportion of substandard units that will be upgraded to standard quality.

Empirical Analysis: A Simulation Using the 1960 Census

The probability distribution of the percentage increase in rent that families would be willing to pay for improved housing was estimated by applying a 50 percent negative income tax to a selected group of families in the 0.1 percent sample of the 1960 Census. Because of the limitations of the data, the analysis was restricted to primary families and individuals who occupied substandard non-farm housing units by paying rent for a unit in any structure or by right of ownership of a single-family unit detached from other housing units or from a business establishment. The study group was further restricted to the above families and individuals whose head earned income solely from wages and salaries or self-employment.[12]

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[11] Guy H. Orcutt and Alice G. Orcutt, "Incentive and Disincentive Experimentation for Income Maintenance Policy Purposes," *American Economic Review* (September, 1968), pp. 754-772.

[12] There were 3,282 families in the study group as defined in the text. 1,136 were in owner-occupied units and 2,146 were in tenant-occupied units. Multiplication by 1,000 yields the size of the universe in 1960 from which the families were sampled.

The study group was restricted to non-farm housing because the cost data were generated from an urban blighted area. Costs in that area may not be representative of rural farm rehabilitation costs. Of course, the same logic may apply to the use of the cost information for rural non-farm housing, but we will take the chance.

Total family income reported by the Census includes a third category besides wages and salaries and self-employment income. This third category includes welfare payments, pensions, social security payments, patent payments, and royalties and rents. We would have liked to exclude only families currently receiving welfare payments, but that was impossible with the data. Instead we excluded all families whose head earned any income from the third category mentioned above. Because families may include several sub-families and other earners, members other than the head may be on welfare, but it seems unlikely since receipt of welfare payments depends on evidence of need. This definition also excluded families and individuals who are poor but whose income is derived wholly or partly from some source other than welfare, wages and salaries, or self-employment.

There were three reasons for the basic selection of the study group. The first was that if families receiving welfare payments had not been excluded, the study would add negative income tax benefits on top of current welfare benefits. This would surely inflate the benefits that would be received under any negative income tax program. The second was that occupants of substandard housing now receiving welfare have not moved from substandard to standard housing. The supplements proposed in income guarantee plans fall below the assistance payments now made to families with dependent children in two-fifths to two-thirds of the

states.[13] Thus, if these families received a negative income tax benefit instead of their current benefits they would certainly not move into standard quality housing. The third follows from the second. If current welfare payments are higher than a negative income tax benefit, they could be meeting needs that a negative income tax plan would not, so that any negative income tax plan that is implemented will likely assist families not covered by the current welfare policies, rather than substitute for current welfare programs.[14]

There is one final problem that needs to be covered before presenting the data. The families and individuals defined by the Census may not be the same group as the unit filing an income tax return. For example, married children may live with one set of parents and file separate income tax returns, so that they would be separate families for income tax purposes. In the Census, however, they would be counted as one family living in the same housing unit. Total income reported is that for both families and not just for the head of the household. Therefore, this study will probably underestimate the benefits received. Some families living with relatives might find it possible to set up separate housekeeping, if a negative income tax program were instituted. This reinforces the underestimation caused by excluding families whose income is low, and is received from sources other than welfare payments, wages and salaries, or self-employment.

Estimates of the benefits to the study group from a 50 percent negative income tax can be expressed as a relative frequency distribution of the percentage increase in income. These estimates were calculated

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[13] Wilcox, p. 258.

[14] Wilcox, p. 257-259.

from data grouped by income class and family size. For the most part the families were grouped by $250 income classes and exact family size so that the estimates are fairly refined. Because of our assumption that the income elasticity of demand for housing is equal to unity, this relative frequency distribution also shows the distribution of families by the percentage increase in rent that they would be willing to pay should they receive benefits under a 50 percent negative income tax plan. The distributions for owner- and tenant-occupied units are shown in the last rows of Tables 1 and 2.

An estimate of the probability distribution of the percentage increase in rent that would be required to cover the cost of rehabilitating housing costs to standard quality were taken directly from a study by Schaaf in which these calculations were made for a slum area in Oakland, California.[15] A 25 percent simple random sample of residential properties in Census Tract 17 in Oakland were appraised for quality using the American Public Health Association (APHA) point system. A subsample of 56 properties were inspected by an experienced architect and contractor. They made an estimate of the cost of upgrading each property to a specified standard, a standard similar to that used in this study. The standard was defined as follows:

> In effect the standard requires the provision of private bath, toilet and kitchen facilities for each dwelling unit plus remedying of any imminently dangerous conditions for which the code (Oakland) reference is clear and unambiguous. It is assumed that the work would represent the absolute mimimum needed and would generally be done in a spirit of unwilling compliance. The emphasis would be upon the avoidance of prosecution rather than upon the possibility that the work done might increase the value of the property.[16]

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[15] A.H. Schaaf, *Economic Analysis of Urban Renewal: Theory, Policy and Area Analysis*, Research Report no. 14, Real Estate Research Program, Institute of Business and Economic Research, University of California, Berkeley, 1960.

[16] Schaaf, p.20

These code compliance cost estimates for the subsample were projected to the whole sample by means of regression equations estimated from the subsample relating the code compliance cost per room to APHA points. From market data on interest rates, economic life, taxes, and maintenance expenditures, gross rent multipliers were estimated. Then, using equation (2) above, estimates of the increase in rent necessary to pay off the code compliance cost were made. Converting these estimates to percentages of current rent, Schaaf obtained the distribution of percentage increases in rent required to pay off rehabilitation costs shown in the last columns of Tables 1 and 2.[17]

Since the distribution of rents families would be willing to pay has come from a different study than that of rents required to pay off rehabilitation, and since the Schaaf study did not indicate the association between family income, family size and cost of code compliance, there is no direct evidence about the association between the percentage increase in rents families would be willing to pay and the percentage increase in rents necessary to pay off the rehabilitation cost. In the absence of such evidence we shall assume that these two events are independent random events. The relative frequency distribution for each event represents the probability distribution for varying percentage increases in rent required or willing to pay. By making this assumption the joint probability of any pair of possible increases in rents families would be willing to pay and required rent increases can be calculated. They are simply the product of the probability that any family in substandard housing without welfare payments will receive a given percentage increase in income from negative income tax benefits (or the same thing, will be willing to increase rent a given percentage) and the probability

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[17]There were 655 renter units and 41 owner units for which cost estimates were made. Some did not require any rehabilitation. These were dropped so the distributions in Tables 1 and 2 are based on 634 renter units and 35 owner units.

Table 1

Tenant-Occupied Units in Study, Relative Frequency Distribution

Percentage Increase in Rents Required to Improve Housing[b]	Percentage Increase in Rents Willing to Pay[a]											
	0	1-10	11-20	21-30	31-40	41-60	61-80	81-100	101-120	121-140	141-160	over 160	TOTAL
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-10	.085	.011	.004	.007	.003	.006	.004	.003	.002	.001	0	.015	.142
11-20	.057	.007	.003	.005	.002	.004	.003	.002	.001	.001	0	.010	.095
21-30	.043	.005	.002	.004	.002	.003	.002	.001	.001	.001	0	.008	.072
31-40	.043	.005	.002	.004	.001	.003	.002	.001	.001	.001	0	.008	.071
41-60	.077	.010	.004	.007	.003	.005	.004	.002	.002	.001	0	.014	.129
61-80	.065	.008	.003	.006	.002	.005	.003	.002	.002	.001	0	.012	.109
81-100	.060	.007	.003	.005	.002	.004	.003	.002	.001	.001	0	.011	.101
101-120	.047	.006	.002	.004	.002	.003	.002	.001	.001	.001	0	.008	.079
121-140	.059	.007	.003	.005	.002	.004	.003	.002	.001	.001	0	.011	.099
141-160	.031	.004	.002	.003	.001	.002	.002	.001	.001	.001	0	.006	.052
over 160	.030	.004	.002	.003	.001	.002	.001	.001	.001	.001	0	.005	.050
TOTAL	.599	.074	.031	.051	.021	.042	.029	.018	.014	.010	.003	.107	1.00

a. Calculated from 0.1 percent sample from 1960 Census

b. Recalculated from A. H. Schaaf, Economic Aspects of Urban Renewal: Theory, Policy and Area Analysis, Research Report #14, Real Estate Research Program, Institute of Business and Economic Research, University of California, Berkeley, 1960, pp. 34 and 37, by dropping units requiring no rehabilitation costs.

Table 2

Owner-Occupied Single Family Units in Study,
Relative Frequency Distribution

Percentage Increase in Rents Required to Improve Housing[b]	Percentage Increase in Rents Willing to Pay[a]								
	0	1-10	11-20	21-30	31-40	41-50	51-100	over 100	TOTAL
0	0	0	0	0	0	0	0	0	0
1-10	.106	.017	.007	.013	.005	.005	.013	.033	.200
11-20	.106	.017	.007	.013	.005	.005	.013	.033	.200
21-30	.076	.012	.005	.010	.004	.004	.010	.024	.143
31-40	.076	.012	.005	.010	.004	.004	.010	.024	.143
41-50	.046	.007	.003	.006	.002	.002	.006	.014	.086
51-100	.091	.014	.006	.011	.004	.004	.011	.029	.171
over 100	.030	.005	.002	.004	.001	.001	.004	.010	.057
TOTAL	.530	.085	.033	.067	.026	.026	.067	.167	1.00

a. Same as Table 1

b. Same as Table 1

of a substandard housing unit requiring a given percentage increase in rent to pay off the rehabilitation cost. These probabilities are shown in Tables 1 and 2.

All those families for whom the percentage increase in rent they would be willing to pay is greater than the percentage increase in rent that would be required to pay off rehabilitation costs would be able to improve their substandard housing unit to standard quality. The step lines through Tables 1 and 2 divide the cells into those groups that can improve their housing to standard quality and those that cannot. All of those cells above the line are groups for whom the rent increase they could pay is greater than that required to rehabilitate. For those cells below the line the rent increase required for rehabilitation is greater. Summing over all the cells above the line, the probability that a tenant living in substandard housing and who receives income only from wages and salaries or self-employment will rehabilitate his house to standard quality is .24. That is, 24 percent of such families will be likely to rehabilitate their housing to standard quality. In the same way, 43 percent of those families living in their own substandard detached housing unit and receiving income only from wages and salaries or self-employment would rehabilitate their house to standard quality.

Applying these percentages to the appropriate estimates of the total number of families in owner- and tenant-occupied substandard non-farm housing units and earning wage and salary income or self-employed income, we find that the total number of units that would have been improved to standard quality in 1960 would have been about 857,000 uiits. If the income elasticity of demand for housing should be only .5 rather than the 1 that was assumed, this estimate of the reduction of substandard

housing would be reduced to about 465,000 units. As a point of comparison, the total number of low-rent housing units supervised by the Housing Assistance Administration was 850,228 units in 1967 after almost thirty years of activity.[18] Nevertheless, there were about 11 million substandard housing units in the United States in 1960.[19]

Conclusion

The magnitude of our estimate of the number of housing units that would be improved to standard quality because of benefits received from a 50 percent negative income tax suggests that a guaranteed income policy could be as important an influence on the quality of housing as current housing policy. Its impact is great enough that it is worth further study. In particular this policy should be compared with other housing policy proposals, such as rent supplements. Further study is also required into the supply side of the housing market. We know very little about the nature of rehabilitation costs. Although there have been many demonstration projects, the data from these studies have not been analyzed in such a way as to be useful for understanding the supply of improvements. There is also a noticeable lack of information on the housing of welfare recipients. This study might have been much simpler if data on how welfare recipients spent their funds were available. In particular it would be useful to know how the quality of their housing changed, or if it did at all, as a result of welfare benefits received.

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[18] U. W. Bureau of the Census, *Statistical Abstract of the United States: 1968.* (89th edition) Washington, D.C., 1968., p. 706.

[19] *Ibid.*